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VIEWS, NEWS AND INTERVIEWS.

The first case arising in Washington, D. C., under the recently promulgated police regulations prohibiting expectorations in street cars came up on June 22, when Joseph Robertson, a laborer, was arrested for spitting in a Pennsylvania avenue car. He was taken before the prosecuting attorney, who held that the arrest was improper, having been made without a warrant and the offense not having been witnessed by the officer making the arrest. Under the circumstances Robertson was not taken into court.

The Lexington correspondent of the New York *Sun* sends the following as one of his latest Kentucky news items:

The question now agitating the minds of the X-Ray Debating Club at Independence is whether Marshal County produces more motormen for Paducah street railways than Ballard County.

A parade of horseless wagons and carriages took place in New York city on June 23 on Broadway, starting from West Thirty-ninth street. A large number of the electrical vehicles were in line.

A director of the Citizens' Street Railroad Company, of Indianapolis, is reported as saying that he is very confident that Judge Showalter will stand by his decision in granting the injunction in the three-cent fare matter. It is stated that the company is to file another bill in equity in the United States Court, setting forth on new grounds the reason why the injunction should be maintained; viz., that three cent fares would mean confiscation of the property and that sufficient data will be supplied to support the representation.

President McKinley has refused the French Telegraph Cable Company permission to land its lines on Cape Cod or any other part of the New England coast on the ground that similar requests made before by other companies for like privileges have been refused by the government. One of the last appearances of Mr. Blaine at the Capitol was to submit an argument before the Senate Commerce Committee against granting the right of a French cable line to land on any part of the Carolina coast.

At a special meeting of the directors of the Consolidated Traction Company, of New Jersey, held in Jersey City recently, the purchase of the trolley line from Jerolomon street, Belleville, to Passaic city, was approved. The line was formerly owned by the Passaic & Newark Traction Company. This acquisition gives the Consolidated company a continuous line from Jersey City to Paterson.

"INDEPENDENT TELEPHONE ASSOCIATION."—HON. J. M. THOMAS, OF CHILLICOTHE, OHIO, ELECTED PRESIDENT AT DETROIT, LAST WEEK.

The New York & Brooklyn Bridge trustees were furnished last week with a new set of plans for the operation of the Brooklyn trolley lines over the bridge roadways. They eliminate the use of the supporting post in Park Row, to which, it is understood, both the Manhattan Elevated Railroad Company and Oswald Ottendorfer objected. The new plans provide for a cantilever loop at the New York terminal to go above the Manhattan Elevated station. To carry them out many changes will be required at the terminal. The plans have been referred to Chief Engineer Martin, who will report to the trustees at their next meeting.

INDEPENDENT TELEPHONE ASSOCIATION OF THE UNITED STATES OF AMERICA.

The Anti-Bell Companies Successfully Perfect a Permanent Organization at Detroit.

A SUBSTANTIAL FUND PROVIDED FOR EXPENSE OF LITIGATION—AN ATTENDANCE OF OVER 500 DELEGATES—J. M. THOMAS, OF CHILLICOTHE, OHIO, ELECTED PRESIDENT, AND W. J. VESEY, OF FORT WAYNE, SECRETARY — A NUMBER OF INTERESTING EXHIBITS.

Between 500 and 700 delegates and members from independent telephone exchanges, coming from over half of the States, met at Harmonie Hall, Detroit, at two o'clock of Tuesday afternoon, June 22, and completed the organization of a national organization, begun at Chicago some three weeks ago. It was suggested by several delegates that the name of the hall might appropriately be changed to Discord Hall, because the first day's proceedings, which were prolonged until the early hours of the following day, were characterized by anything but the harmony and good feeling supposed to be essential, not only to a successful telephone conversation, but equally necessary at a convention of telephone interests, where united action would seem to be necessary in meeting a common foe. All sorts of talk was indulged in by delegates, who grew uncomfortably warm and retired to the hallway outside, where they discussed the situation in small groups with one another. And there were angry men among them, also some disappointed ones. Among the latter were the four delegates from Pennsylvania, who held proxies for 27 representatives of the many exchanges comprised in the Tri-State Independent Telephone Association, of western Pennsylvania, West Virginia and eastern Ohio, and who had walked out of the hall following the adverse decision on their voting for the 23 men whom they represented by proxy, as stated elsewhere in this report. "The convention is packed in the interest of a clique," exclaimed one angry man. "They are too conscientious," was the retort of another, in disgust.

The opinion was held in several quarters, notably by delegates from the West, principally Chicago, that a Detroit telephone clique had packed the convention in the interest of Alexander I. McLeod, of that city, a candidate for secretary to succeed Mr. Vesey, of Indiana. By the morning of the second day, however, all discordant elements were harmonized, and "The Independent Telephone Association of the United States of America" was duly organized.

TUESDAY, JUNE 22.

It was considerably after the time agreed upon when Charles Flowers, of the Detroit Telephone Company, called the meeting to order and introduced Mayor Maybury, who, in happy style, welcomed the gathering to Detroit, extending the freedom of the city and "catching" the convention at the start by some humorous remarks about the "telephone girl"—the lady whom everybody loved, everybody heard, but no one ever saw.

Mr. Chas. Flowers then made a brief address of welcome on behalf of the Detroit Telephone Company, and, in his remarks, referred to the possibilities of a great national organization like this becoming commercially beneficial. He believed that, among the independent telephone movement, the spirit of speculation had about died out, and a spirit of good business enterprise had supplanted it. He thought that the time had come when he who wishes to speak to another should not be taxed or fined for the sole purpose of continuing an unjust monopoly.

Judge James M. Thomas, of Chillicothe, Ohio, the president of the asso-

ciation, then appeared, and at once launched into a lengthy speech by complimenting Mayor Maybury upon the nice things he had said, and declared that those delegates who came to Detroit to complete the organization of the independent telephone association would be very ungrateful if they were to go away with Detroit's hospitality unappreciated. Judge Thomas also paid an eloquent tribute to the beauties of Detroit, and, after explaining the objects of the convention, called attention to the importance of accomplishing some definite result and not go home with the work half finished. After the applause following Judge Thomas's remarks had died out, Mr. Flowers said:

"Before proceeding with the regular order of business, it has been thought best to have a few remarks from our esteemed friend, Judge R. S. Taylor, of Indiana."

Judge Taylor said that the last public gathering he attended in Detroit was the Presbyterian General Assembly.

"It was discussing the Briggs case and trying to find a way to check free speech," said he. "Now I am attending one to promote free speech, and I like this one better. We are told that a man named Jacob once worked on a stock farm seven years for a wife. It was a big price to pay for a wife. They are cheaper now—to get—but more costly to keep. Well, when Jacob was going downtown to get a license the old stock-raiser sprung a back-number girl on him, and told him if he wanted Rachael he must work another seven years. This was the greatest fraud in history.

"The Bell company is the greatest old stock-raiser that ever sheared the American sheep. It made a bargain to work the people 17 years, and then it would give them a free telephone. But at the end of the 17 years it sprung an old back-number and wanted another 17 years."

This last remark referred to the Berliner patent. The judge went on to say that the American people had paid a bigger price for the invention of the telephone than for any invention that had been given to the world. He then went over the history of the Berliner case to show, what has often been said, that the recent decision of the United States Supreme Court did not touch the validity of the patent, but was only upon the regularity of the proceedings in the Patent Office. Of the decision he said:

"I am not pleased with it and did what I could to have it otherwise. But all lawyers know that what is plainly and inherently right is not always law. The ground taken by the government was new and there was no precedent for it. But we know, as lawyers, that it is not enough to show in court that you are right—you must have some law or precedent to back you up."

He said he had no fear of the Berliner patent. "It is the most stupendous and diabolical fraud ever perpetrated," he argued. "It gave nothing to the world. The telephone would be just where it is to-day if Berliner had never lived."

Judge Taylor's remarks, while quite lengthy, were attentively received and frequently interrupted by applause.

"INDEPENDENT TELEPHONE ASSOCIATION"—MR. W. J. VESEY, OF FORT WAYNE, IND., ELECTED SECRETARY AT DETROIT CONVENTION LAST WEEK.

President Thomas then said he would consider that the convention had met according to the official call from Chicago. He then read his opening speech and, it will be noticed, did not mince matters in his allusions to the American Bell Telephone Company:

It is an honor to preside over the temporary deliberations of so large and intelligent a body of men, gathered from all quarters of the greatest country in the world. We come together to promote the interests of a just cause, and on behalf of the people of this great nation. We know no party, no creed, no State, no North, no South, no East, no West; but the motive that brings us together is pure, is just and right, and is as broad as the expanse of our great territory. Having one common object, and that object being pure and right, we have no room for disagreement, and I sincerely hope that, during the whole course of our deliberations, we will keep this fact clearly in mind.

We are told, in some of our journals, that the telephone business is and must of necessity be a "natural monopoly." We answer that by saying that the people of this free country abhor either a natural or an artificial monopoly as does nature abhor a vacuum. It is strange that the American Bell Telephone Company has spent so many millions of dollars in trying to maintain a monopoly when nature has been so kind as to give them natural protection. If these journals are right, old Mother Nature must have been away from home the past two years, and has forgotten to instruct the boys to look after this natural monopoly in her absence.

We are told again in these same journals that the independent telephone movement has been a failure, and they cite us to a few instances where persons or corporations without capital have been so unfortunate as to have executions levied upon their property and the same offered for sale by the sheriff.

Of course, one would infer from these paid articles that this is the only business in which this state of affairs exists. They apparently forget that more than 1,000 independent telephone companies are to-day doing a successful and profitable business. It seems to one, after studying the situation and watching closely the movements of the American Bell Telephone Company and its lessees, that those companies have not fully comprehended the vast territory of this country.

When we stop to consider that, up to two year ago, there were only comparatively few people in the United States who felt themselves able to pay for telephones, on account of the exorbitant charges made by these companies, and, at the same time, think of the progress that has been made in the telephone enterprise in other countries, it seems that they have taken a very narrow view of the subject.

There is no country in the world where there is such a great demand for rapid communication as in the United States. Our people are quick to act, always energetic when engaged in any business, and have not the patience to await slow communications.

There is always a demand for faster mail trains; there is always a demand for quicker telegraph and more rapid telephone communications, and, since it has been demonstrated that the price of the telephone can be reduced to a point where the common people can afford not only to use it in their business, but also in their domestic affairs, the desire for quick communications has been increased to a very great extent. In fact, the people demand this as their right, and any action of the American Bell Telephone Company under a pretense of still owning fundamental patents will be met with a very decided opposition by the great masses of the people.

The people have looked forward to the time when, under our patent laws, this invention would be open to fair competition. The people fully believe that that time has arrived. We have been taught to believe that our government, under our patent laws, protects an invention for a period of 17 years and no more. We know that the microphone has been in use more than that time, and that the owners of patents upon that invention have had their full protection under the law. Men all over the country, who have studied the patent situation, know that the rights of the American Bell Telephone Company under their fundamental patents have expired. We claim now the right under our government to use those inventions for the public good.

Why should these rights be denied us? Or why should the capital invested by men who are well aware of these rights be jeopardized, and their business threatened by a company whose rights to hold a monopoly under those patents have long since expired? Why should we longer be annoyed by notices and threats made in newspapers to refrain from using this invention?

We are unable to explain to ourselves why this state of affairs should go on, and knowing that the great masses of the people are in harmony with this movement, we meet to day for the purpose of forming a permanent organization for the mutual protection of those who have invested their money in this enterprise, as well as the protection of the rights of the great masses of the people of this country.

If we are wrong as to our understanding of the law of this country, and the American Bell Telephone Company still has a right under the Berliner patent of 1891 to a monopoly of the microphone, we will abide the decision of the courts of this country; if we are right, we demand as a matter of right that we be allowed to enjoy the privilege of the use of this invention without further annoyance. I have never been able to explain why a great corporation should be so short-sighted as to insist upon something that neither reason nor law guarantees them in trying to hold.

It would be far better for them to concede what might be a right than through even a technicality of the law to attempt to rob the people of that which in reality and fairness belongs to them. There is plenty of room in the United States for every manufacturer of telephones, for every company that is operating a telephone system or toll line, and if we were all as industrious for the next 25 years as the independent telephone people have been the past two years, our territory would not then be half covered. It will be a long time before this country can say that there is one telephone in operation for every 11 inhabitants, within municipal districts. Holland can now boast that in that country the telephone business has reached that point. How has it been brought about? Simply from the fact that since the invention of the telephone prices have been moderate. If we look into the telephone business in a few other countries, certainly we will find every encouragement to proceed with renewed energy to build up a complete system in this country.

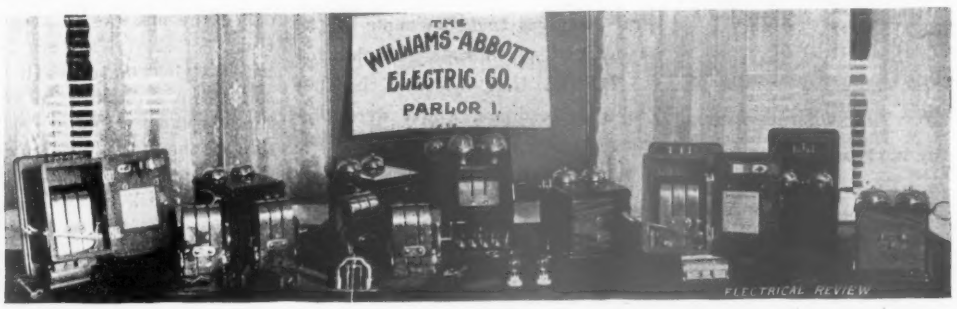
The history of the independent telephone movement in the countries of Norway and Sweden certainly furnishes great encouragement to those who have undertaken this enterprise in the United States. We are told that in these countries there is in operation one telephone for every 17 inhabitants within municipal boundaries. The Bell Telephone Company was the first to enter the field in these countries. They followed their policy of high prices and independent management, heeding not the demand nor the desire of the people; and, as the result of that policy, were enabled to place only a few telephones in operation.

The opposition telephone company came into being, established an exchange in the city of Stockholm at moderate prices, and adopted a policy of accommodating their patrons. In a short time the independent company was operating nearly five times as many telephones as were operated by the Bell Telephone Company at the time they entered the field. This was followed in other cities in these countries, and in a short time the Bell Telephone Company was compelled to retire from the city of Stockholm, sold its property to the independent company for what it could obtain, and the same result followed in the other important cities of the countries, until to-day the telephone system of these two countries is owned and in the control of the people who in no wise are connected with the Bell Telephone Company.

This will certainly be encouragement enough, and it is safe to predict that, unless the Bell Telephone Company changes its policy, the same result will follow in this country. There are hundreds of cities throughout the United States where the lessees of the Bell Telephone Company do not receive enough income to pay their employés.

It is a remarkable fact that, for more than two years, the independent telephone exchanges in hundreds of cities throughout this country have continually increased their patrons, while the lessees of the Bell Telephone Company were furnishing telephones free to any one who would allow them to place one in his residence or place of business. This is certainly a true indication of the feeling of the people. I have often wondered if the American Bell Telephone Company fully realized this state of affairs. If they do, it certainly affords its managers food for thought. There is always some reason when a man will pay for something that he has an opportunity to receive for nothing.

There has been more than $20,000,000 invested in the independent telephone enterprise in this country; but a greater capital



"INDEPENDENT TELEPHONE ASSOCIATION"—EXHIBIT OF THE WILLIAMS-ABBOTT ELECTRIC COMPANY, AT THE DETROIT CONVENTION.

stock than all this money is the fact that we have the sympathy of the people and have, in every locality where a successfully managed independent telephone exchange exists, a local influence which can never be taken from us so long as we do our duty, the case sufficient to exact peace, then let the war go on. The American Bell Telephone Company will find that this battle is its Waterloo. It will find that others have been thinking while its officers have been scheming to make money. It will find, too, of the American Bell Telephone Company to say which policy they will pursue; but it should understand, whether in peace or war, we will meet them, in peace we will greet them, in war will surely defeat them. [Applause.]

"INDEPENDENT TELEPHONE ASSOCIATION"—EXHIBIT OF THE WESTERN TELEPHONE CONSTRUCTION COMPANY AT THE DETROIT CONVENTION.

give good service and subserve to the wishes of the citizens.

It was predicted by every important journal in this country in the early days of the telephone that it would succeed and do away with the telegraph. The Western Union Telegraph Company must have believed that this prediction would come true, for we find them in the great race to get control of patents. It seems that they risked their fortunes with Edison, while Bell, Blake and Berliner were gathered in by the American Bell Telephone Company.

Then, after a brief struggle for the telephone field, we find an agreement was made between these two great corporations, in which it was provided, to the satisfactory arrangement of both, that one should retire from the telephone field in consideration of several million dollars. So the prophets' prediction failed. The telegraph business continued as before. The telephone was conducted so quietly that the people never dreamed of the immense fortunes which were being accumulated under these patents and under these arrangements until their attention was called to it by this independent telephone war.

We believe that the contract made between the Western Union Telegraph Company and the American Bell Telephone Company has done more to retard the universal use of quick communication than anything that has ever happened since the invention of the telegraph and the telephone. So soon as this battle is over the people will be surprised at the growth which rapid communication will make.

Messages will be transmitted over telephone wires and recorded at the receiving end, delivered to the party addressed, and the answer returned, recorded and delivered without causing people to wait for lines and to get parties to the 'phone. Time will be saved, more words will be transmitted at the same expense, and the commercial world will feel the advantage of this form of communication

It will not be long until the telephone is a very essential feature of our post office department. So much letter writing is burdensome, and with all the advantages of our fast trains we are impatient with this manner of communication. We would be better pleased, and time would be saved, if for a reasonable sum of money we could talk to those with whom we have business or with whom we desire to communicate.

Taking then the vast territory, our great population of 70,000,000 of people, this great and growing demand for quick communication and the probability that it may in the near future be adopted as the greatest department of our postal system, the field is so great that it seems folly for one company or one corporation to stop progress by giving time to quarreling, contention and litigation. There is still room for more to enter this great field, and one need have no fear of competition in the next half century.

If, however, there is not in this view of that our courts will uphold the law as the law is brought under the state of fact proven. It will find, also, that it will not be trying the suit of the government for the cancellation of a patent. It will find that evidence exists which, when the proper time comes, will be shown to the courts, and it will find that the courts will decide as the judges presiding over them are bound to do under their oath, according to the law and the facts.

The following committee of five on credentials was then appointed: Alex. I. McLeod, Detroit, chairman; W. L. Crissmann, Cedar Rapids, Iowa; E. A. Andress, Lafayette, Ind.; P. E. Blow, Knoxville, Tenn., and A. B. Hoyle, Cambridge, Ohio.

started over the committee's report. Briefly, the committee had decided that four delegates from Pennsylvania, West Virginia and eastern Ohio, representing the 27 exchanges in the Tri-State telephone exchange, could not vote for any other than the individual companies they represented, although they had been elected to vote as proxies for the other 23 companies.

A motion by a Pennsylvania delegate to have laid on the table the report of the committee on credentials was lost, and then the convention adopted the report.

The report of the committee on credentials gave a list of exchanges entitled to one vote each, and also a list of manufacturers entitled to representation. The list is as follows:

DELEGATES.

O. E. Harmon, South Haven, Mich.
Wm. Hoyle, Cambridge, Ohio.
J. M Nelson, Cambridge, Ohio.
R. J. Morrison, Steubenville, Ohio.
H. B. Hanford, Norwalk, Ohio.
F. W. Gradolph, Oak Harbor, Ohio.
W. H Rush, Bowling Green Ohio.
A. G. Gordon, Massillon, Ohio.
E. J. Evans, Youngstown, Ohio.
F. C. Manning, Camden, S. C.
Oscar Wise, Butler, Ohio.
A. B. Burkholder, Ashland, Ohio.
Albert Button, Painsville, Ohio.
F. A. Searl, Painsville, Ohio.
Dr. W. W. Tobey, Danville Ill.
M. M. Heron, Millersberg, Ohio.
D. S. Olmstead, Millersberg, Ohio.
G. F. Spencer, Sandusky, Ohio.
L. Duenisch, Sandusky, Ohio.
J. S. Brailey, Wauseon, Ohio.
Thos. W. Gannon, Cairo, Ill.
James M. Harner, Braddock, Pa.
George Moore, Braddock, Pa.
C. F. Heidley, Leipsic, Ohio.
G. W. Reisser, Ottawa, Ohio.
Wm. N. Gladson, Fayetteville, Ark.
F. A. Brooks, Charleston, Ill.
E. A. Croll, Iron Mountain, Mich.
W. C. M. Ryan, Hampton, Va.
L. A. Carr, Durham, N. C.
T. H. Johnson, Sioux City, Iowa.

"INDEPENDENT TELEPHONE ASSOCIATION"—EXHIBIT OF THE AMERICAN ELECTRIC TELEPHONE COMPANY AT THE DETROIT CONVENTION.

And while they boast of their victories and say nothing of their numerous defeats, and while they boast of their great technical lawyers, of their many millions of money, and their numerous expert witnesses which have been retained, still they will find that in this great country there are others equally as learned who are ready and willing to espouse the cause of this movement, knowing that a great victory will reward their efforts. It remains then for managers

The credentials committee reported that nearly 100 telephone exchanges had properly accredited representatives present, and about 30 manufacturing companies were also entitled to membership in the convention.

Diversion was caused by a row

J. W. Doudna, Barnesville, Ohio.
D. Jamison, Newcastle, Pa.
A. V. Dively, Altoona, Pa.
T. J. Shufflin, Butler, Pa.
S. C. S. Keel, Waterloo, Ill.
Peter E. Blow, Knoxville, Tenn.
J. C. Duncan, Knoxville, Tenn.
G. L. Hartwig, Cleveland, Tenn.
C. C. Crochran, Bristol, Tenn.
Chas. E. Phelphs, Jr., Wilmington, Del.

(Continued on page 316.)

THE NIAGARA-BUFFALO TRANSMISSION LINE.

READ BEFORE THE NATIONAL ELECTRIC LIGHT ASSOCIATION, JUNE 9, 1897, BY J. G. WHITE.

(*Continued from page 298.*)

First cost within reasonable limits should always be considered secondary to good construction, so that you will probably concur in awarding first place as a factor in problems of this nature to the avoiding of interruptions. This is surely of primary importance in most lighting work, and it is easy to conceive of circumstances where the unexpected shutting off of power might have more serious or possibly more fatal results than could ever arise from sudden deprivation of light. Entering into this problem of sure and continuous operation, we have the same two factors entering which usually confront us in connection with any electrical installation; namely, insulation and mechanical strength. In low-tension plants of all kinds the insulation is usually accomplished with ease, and any probable defects are likely to be of minor importance; but on such a line as that under discussion the importance of these two factors is practically equal and they are mutually inter-dependent. This has been practically illustrated by the experience afforded by the present line. With units of an ordinary size a short-circuit on a line carrying 10,000 volts, even if through a defective insulator, a wooden cross-arm and a wooden pole, would make itself manifest at the power station by the opening of a circuit-breaker, the blowing of a fuse or some similar method. With the huge generators which furnish power for the line the effects are different. Of what importance to a 5,000-horse-power dynamo is the current which will leak down a wood pole, even when wet? Nevertheless, this same current is sufficient to char or burn the pin under a defective insulator. During one night last Fall, while an attempt was being made to operate the line on temporary insulators, the best obtainable at the time, the ends of no less than five of the large cross-arms used on this line were burned entirely off, and this, too, without any manifestation having been made at the station that anything unusual had occurred. This naturally raises the questions whether it is possible to procure insulators which can be depended on to maintain the insulation on a circuit carrying 10,000 volts or over, and whether it is not good practice to have fewer poles and, consequently, less weak spots in the form of insulators. There are two sides to this question, and both deserve serious consideration in designing any transmission line. Let us assume that poles are set 100 feet apart and allow a sag in wires, between supports, of 20 inches, or one-sixtieth of the length of the span; we find that the area of the wire in use on this line is .267 of one square inch, and that its tensile strength, even assuming a high value for soft copper, is about 10,000 pounds. Allowing the same deflection, one-sixtieth of the length of the span, this determines the maximum safe distance between poles as 178 feet, allowing a factor of safety of four, and shows that the cables might be expected to break if the span were lengthened to 712 feet, not allowing for wind pressure or extra load due to ice.

Assuming a tensile strength of 8,000 pounds per square inch for yellow pine, we find that the larger cross-arms used on the line, which are 12 feet long and nearly five inches wide by six inches high, would support a load of 270 pounds on each end without bracing, and of 360 pounds on each end with the steel angle braces used, and this, too, with a factor of safety, of 10, an unnecessary margin when we consider that the arms are all specially selected heart long leaf Georgia pine. Similarly these cross-arms would have the same factor of safety carrying three power cables on each side with spans 177 feet long if without braces, and 366 feet long with braces. Besides giving this added strength the braces used on this line prevent such vibration and oscillation as usually take place with the ordinary strap-iron braces, such oscillation being the cause of many of the petty troubles on ordinary lines. These braces were each made from a single piece of steel angle two and one-half inches by two inches by one-quarter inch, bent to shape and forming, when finished, a truss 18 inches deep and five feet in extreme length, their weight being a little over 20 pounds each. Assuming again that poles are set 100 feet apart, we find that 12 wires with cross-arms, insulators, etc., would present an area to the wind aggregating about 67 square feet, and that, consequently, each pole would be subjected to a side strain, when wind pressure was 30 pounds per square foot, of about 2,010 pounds. A sound, 50-foot cedar pole, eight inches in diameter at top and 18 inches in diameter at butt, eight feet being held rigidly in the ground, would be capable of withstanding, before breaking, a side pressure near its top of only about 4,900 pounds, and of only about 3,400 pounds when a layer two inches thick had decayed around its circumference.

With spans of 100 feet the pole would therefore have a factor of safety of only about two and one-half when new, while the wires would have a factor of safety of about seven, and the cross-arms of about 26. The advantages of having cross-arms amply strong are so evident, and the possible reduction in cost such an insignificant part of any ordinary line carrying much copper, that it would seem foolish to reduce the size of these in order to bring their strength down to correspond with other parts of the line.

It is evident from the above that the weakest point of this line, mechanically, is the pole, in spite of the fact that, as advised by one of the prominent members of your executive committee, final decision was made in favor of spacing the poles 75 feet apart on straight, and proportionately closer on curved parts of the route. The only reasonably safe and practical method of decreasing the number of weak spots furnished by the insulators would be to use poles larger than eight-inch tops, or to brace the poles to withstand this wind strain. Fifty-foot poles having tops greater than eight inches are now hard to find, and, although 35-foot poles were used on a part of the company's private right of way, nevertheless, many 50-foot, and even a few 65-foot poles were required to avoid obstructions and for crossing railroads and highways. The only feasible plan, therefore, would seem to be to brace the poles laterally, which can readily be done if set in pairs, but which would be very difficult to accomplish in a satisfactory manner with a single line. This naturally brings us back to the question, "Are insulators such insurmountably weak links in such a chain, and is it not possible to get insulators which can be depended on even when supporting wires under a pressure of 10,000 volts?" This can be most satisfactorily answered by again narrating the experience with this line. During the past eight months insulators have been sent to Niagara Falls by four of the works which are amongst the first six in this country in the production of porcelain for electrical use. Of a sample lot of 10, received a few days ago for test from one of these factories, one had broken in transit, eight broke down under the strain of electrical pressure, varying from 16,000 to 36,000 volts, and the last broke down under 40,000 volts strain. This latter would seem to be a minimum safe test limit for any insulator expected to sustain a regular strain of 10,000 volts, and is a test which any mechanically good, well vitrified insulator of ordinary design will pass. As several previous lots from the same factory showed even poorer results, the manager of that company states that he hopes within a few weeks to be able to furnish insulators which will stand a 40,000-volt test. It is only fair to state that these insulators were of a smaller type than, and different design from, those in use in the Niagara line. Several lots of somewhat similar insulators from another factory gave about the same results.

Several thousand insulators of a diameter almost equal to the round type now on the line, but of a design somewhat different in details, were furnished by a third porcelain works. These were all supposed to have been tested and to have successfully withstood a pressure of 40,000 volts at the factory before shipment. When, however, these were tested at Niagara Falls, by Mr. Lincoln, the electrical superintendent of the Cataract Construction Company, it was found that a large majority of them broke down under a 40,000-volt test, illustrating that a dry test, such as had been previously made, is useless for practical purposes. The method of test used at Niagara Falls, was as follows: The insulators were set inverted in a shallow iron pan, in lots of about 20, the bottom of the pan being covered with an inch or two of water containing a little salt. A little of the same brine was poured into the pin-hole of each insulator, and into this was thrust a small piece of metal such as an ordinary iron spike or the small round zinc rod from an ordinary sal-amoniac battery, this being connected to one side of the testing circuit, the other being connected to the pan containing the insulators. After the metal rod had been placed in the brine in the pin-hole of an insulator, the primary circuit of the testing transformers, specially built for the purpose, was closed; and, if the insulator was weak, this was quickly manifested by a series of sparks through the punctured porcelain. Experiments made with pure water and with brine showed that there was no difference in the results; but that any weakness was manifested a little more quickly with brine, besides which the salt imparted the characteristic bright sodium color to sparks, otherwise almost colorless and difficult to detect.

As it was important that the line should be ready to deliver current by a specified date, the test was reduced on these insulators to 20,000 volts, and all which withstood this pressure were passed for temporary use. These insulators were later replaced by some of those now on the line, all of which successfully passed a 40,000-volt test, made as above described.

A lot of the temporary insulators illustrated the old saying that every rule has its exception, for when, after removal from the line, they were tested under 40,000-volts pressure, a solitary insulator from a total of 1,150 was able to pass muster.

Of the insulators shipped by the fourth factory and of the two types now on the line about 25 to 40 per cent were usually found to be defective, breaking down under 40,000 volts, this percentage decreasing in the last shipments received. It is, however, worthy of special note that since the last of the temporary insulators were removed from the line, there has not been one minute's suspension of current supply due to defective insulators. During this time, some three or four months, three insulators have been replaced, none of these being of the oval type. Two of these three had been broken while being put in place, and the third was broken by a stone or other missile. In all three cases only the outer petticoat was broken, and the insulator continued to do satisfactory service until such time as it could be replaced without affecting the operation of the line. Apparently, therefore, it has been demonstrated that it is possible to secure insulators which are reliable. That there have been no greater troubles in the past from defective insulators is probably due to the fact that most of the large transmission plants in operation under high voltage, up to within a few months, have been in the far West, where a climate prevails very different from that natural to this immediate region.

In the above, and other experiments with insulators, some interesting facts have developed and are worthy of note. The insulating strength of porcelain depends almost entirely on the thoroughness of its vitrification and very little on its thickness, a thin china teacup having successfully withstood a pressure of 60,000 volts, while a porous piece of porcelain, two inches thick, was readily pierced by 20,000 volts. It is, therefore, practically unnecessary to test electrically any insulator which, when broken, will not pass a good absorption test, using red ink or other fluid.

It is quite, if not entirely, impossible to puncture a glass insulator, even an ordinary pony telegraph insulator withstanding any pressure which can be applied, the last being determined by the pressure which will send an arc around the insulator. The objection to using glass insulators in the past has been due to the difficulty in getting a well annealed and mechanically strong insulator of such massive design as is needed for this work and to the hydroscopic property of glass, which is not shared by porcelain. The first can unquestionably be overcome by care in manufacture. The importance of the second has probably been exaggerated in most calculations made in the past, due to an inadequate appreciation of the static effects of 10,000 volts in warding off snow-flakes and drops of rain, and to a less extent of the rapidity with which water falling on such insulators is evaporated by the heat of the current leaking over the surface.

It is, consequently, reasonable to expect that the use of glass insulators for high-voltage lines will greatly increase with improved manufacture. Meantime any lines erected should have the best obtainable porcelain, and every insulator should be subjected to test.

(*To be continued.*)

Manyana.

[*From Profitable Advertising.*]

The ad. you intend to publish next month isn't bringing you business today.

ELECTRIC RAILWAY NOTES.

The Gettysburg, Pa., Electric Railway has been sold to Horace A. Doan, Max Riebenack and Luther H. Bent for $50,000.

The Ballston Spa, N. Y., Terminal Railway (an electric trolley system covering several towns) has passed into control and management of Justus Cox, Jr., of Philadelphia, Pa.

The Louisville, Ky., Street Railway Company, J. B. Speed, president, will expend $250,000 in replacing animal power by electric motors on its street railway lines in Louisville.

The regular quarterly dividend of one and one quarter per cent has been declared by the Metropolitan Traction Company, of New York city, payable July 15. Books close June 30 and reopen July 16.

The Railroad Commissioners have granted the application of the Metropolitan Street Railway Company, of New York, for permission to change its motive power on the Fourth and Madison avenue lines from horses to underground electricity.

It is rumored that the People's Railway Company and the City Railroad, of Dayton, Ohio, will shortly consolidate. The People's is a consolidation of the White Line and Third street lines, of Dayton, and the stock is mostly owned by Cincinnati parties.

The Brooklyn Heights Railroad Company, of Brooklyn, N. Y., has called a sudden halt on the extensive transfer system by which, for a single fare, a passenger could shift himself from one to almost any other line of the road. In lieu, however, of the usual transfers, through cars to all the favorite suburban resorts will be run with more frequency for a single fare.

The Chicago, Ill., & Northern Pacific Railroad will change its equipment from steam to electric power on July 1. It has also arranged with the Metropolitan Elevated to run its trains into the city over that line. The road was leased about a year ago by the Suburban Railroad Company for 50 years. It controls 15 miles of double track, and takes in all the suburbs west of the city in a territory having about 200,000 population.

The traffic arrangement just made by the Consolidated Traction Company, of New Jersey, with the Paterson Railway Company added 40 miles to the system, making a total of over 215 miles. This is believed to be the most extensive system of connecting electric roads in the United States, and probably in the world. The joint traffic arrangement gives easy and cheap communication between over 20 important cities and towns and hundreds of villages.

The Easton, Palmer & Bethlehem, Pa., Street Railway Company, with a capital stock of $150,000, has been granted a charter for a road between Easton and Bethlehem. W. B. Ferguson, of Boston, is the president, and Charles E. Barnes, of Plymouth, Mass., the treasurer; among the directors is C. A. Richardson, of Boston; the incorporators include Frank E. Lowe, Greenfield, Mass.; Michael P. McGrath, George A. Murch and Wesley A. Kendall, Worcester, Mass., and N. Sumner Merrick, of Boston.

Plans are maturing for an extensive system of electric railway lines to connect Missouri and Kansas towns. At present Joplin, Webb City, Carterville and Carthage, Mo., and Galena, Kas., are connected by the Southwest Missouri Electric line. The Galena council has just granted a franchise to the Southwest Kansas Electric Railway Company to run through its main street. This road is to be built to Baxter Springs, and by way of Empire to Joplin, making a circuit of about 30 miles through some of the richest mining lands in the district.

The New York State Railroad Commissioners announced in Albany last week their favorable decision on the application of the Metropolitan Street Railway Company for permission to introduce the underground trolley system of traction on the Fourth and Madison avenue lines in New York city. President H. H. Vreeland, of the street railway company, said that the company would begin the work of electric installment as soon as practicable, but that he could not be more precise as to date, as there had been no conference since the decision was announced.

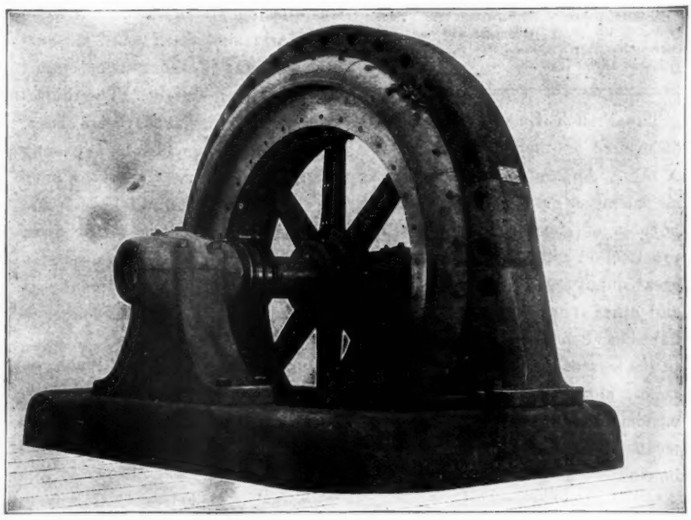
Albert Appleton, in the Supreme Court in Brooklyn, N. Y., last week began suit against the Atlantic Avenue Railroad Company to recover $25,000 damages for injuries received while employed as a conductor. He said that the car gave a sudden jerk, and in order to save himself he grabbed one of the signs on the car, which gave way. He fell to the ground, receiving a fracture of the left arm and other injuries. Counsel for the company moved for a dismissal of the suit, as the signs were not placed in position for passengers or others to touch. The motion was granted.

The Revolving Field Type of Alternating-Current Generator.

The development of the revolving field type of alternating-current generator and the standardization of a complete line, both for the monocyclic and three-phase systems, has of late occupied the attention of the engineering department of the General Electric Company with successful results. The alternators are designed for the standard frequency of 60 cycles and for pressures ranging between 500 and 5,000 volts.

The machines are built on the same lines as the General Electric type of induction motor. The stationary armature is built up of laminations stamped from specially selected and tested steel plates. Ample spaces are left for ventilation and the coils are covered and protected by shields. The base of the armature is of smooth cast-iron and the pedestals supporting the bearings are provided with spherical seats, which support the boxes and allow of perfect alignment.

The removal bearings are, of course, self-oiling, with the oilways so cut as to give an even flow of oil from the resting places of the rings in the shaft to the end of the bearings where the oil returns to the reservoir.



GENERAL ELECTRIC COMPANY'S REVOLVING FIELD ALTERNATING-CURRENT GENERATOR.

The revolving field is extremely simple of construction. It is merely an iron spider mounted on a shaft carrying a soft-steel ring serving as a yoke for the pole pieces, which are made up of laminated iron with polar projections. The field coils are removable, and in the larger sizes are wound with flat copper strips placed edgewise to allow of free egress from the coils of any heat. The armature can be moved along the base to facilitate access to fields and armature winding.

With a high efficiency, these alternators combine good inherent regulation and can be, if desired, compounded for accurate automatic regulation. Such compounding in certain cases is not necessary to convenient operation and may be omitted. When compounded, a commutator is mounted on the shaft and rectifies current supplied from a series transformer in the main circuit. These compounding devices are not, however, included in the generator, properly so called. They come under the head of extras. The temperature of the armature and the field windings does not rise above 45 degrees centigrade above that of the surrounding atmosphere.

The new type of generator is not, of course, intended to displace the revolving armature type. The revolving field type has its own special field of usefulness. It is free from high-potential collector rings and commutators, the only collector rings being the two used to bring the exciting current to the revolving fields. The high-potential part of the alternator—the armature—being a stationary structure can be wound and insulated for much higher pressures than is desirable for revolving armatures, and the current can be fed directly into the line without the intermediary of step-up transformers. All the high-potential terminals are effectually insulated.

The revolving field alternators can be wound for the two-phase system when desired, and when so wound are so arranged that armature coils can be cut in or out to give independent regulation of the two phases.

During the past year the General Electric Company has built a number of machines of this type, some for belt drive, but principally for direct connection to water wheels and steam engines. The illustration shows a 750-kilowatt, 40-pole, three-phase machine, running at 175 revolutions and delivering current at 4,400 volts. It is one of 12 which will be used on the great Lachine Rapids installation.

Dyer & Driscoll.

Messrs. Dyer & Driscoll, the well known patent experts and attorneys, have removed to the new Bank of Commerce Building, 31 Nassau street, New York city. This building is one of the finest in the metropolis and Messrs. Dyer & Driscoll have secured handsome and commodious quarters on the twelfth floor, where express elevators will rapidly carry their numerous clients.

The increased room in the new quarters enables a larger force to be employed, and, while the firm has been in its new place since before May 1, it has not especially desired to make known the fact of its removal to prospective new clients until it was thoroughly settled and equipped for conducting new business. The firm continues to make a specialty of electrical inventions of importance, both in the matter of obtaining patents thereon and in connection with litigation in relation thereto.

At a meeting of the Oxford & Welchville, Me., Electric Railroad Company, George W. Hazen, of Oxford, was elected president; G. W. McFadden, of Auburn, vice-president, and John B. Robertson, of Oxford, treasurer. About $8,000 of the necessary $20,000 is subscribed, and the outlook for the construction of the road in the near future is excellent.

Electrical Review

Times Building, 41 Park Row,

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EDITOR:
CHARLES W. PRICE.

ASSOCIATE EDITOR:
STEPHEN L. COLES.

NEW YORK, JUNE 30, 1897.

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The French Customs Service has discovered another new use for the X rays. Apparatus is to be kept at all the larger customs offices for the purpose of checking the prevailing practice of smuggling. Heretofore great quantities of watches, jewelry and other articles of high valuation have been concealed by stowing them in the legs of tables, and ink receptacles, and have thus escaped the custom officers. It is believed that by means of the X rays such articles will be readily detected.

The most conspicuous display feature of the Queen Victoria Jubilee in London last week was the reflection on St. Paul's dome of a number of electric searchlights. The electric lamp decorations along the line of the procession were also a noticeable exhibit. Yet when Victoria was crowned Queen the electric light, the telephone and the telegraph were unknown to the world. What wonderful triumphs of science her reign has witnessed?

Only a few months have elapsed since the operation began of the plant for electrically using the power of Niagara Falls. Last week, new contracts were awarded for apparatus for developing the power of the upper St. Lawrence for distribution by transmission throughout extensive adjacent country. The work will be the largest of the kind yet undertaken, and nearly doubles in magnitude that successfully installed at the Falls of Niagara. The task is entered into after a searching and critical study of the Niagara Falls adaptation, and the same machines, covered by the Tesla patents, will be used as are in place there. English capital is backing the new enterprise, and, we believe, its engineering and financial success is beyond question.

In spite of the assertions of several of our contemporaries to the contrary, it has been practically proved that it is possible to burglarize a safe by means of electrical current obtained by tapping an electric railway circuit. At Chagrin Falls, Ohio, early last Saturday evening, burglars entered the bank of Rogers & Son, having previously attached a wire to the trolley line of an electric railway. This wire was carried through a transom to the safe. Another wire was attached to the track rail and brought into the bank. A carbon point was used to create an arc, and an attempt was made to melt the knob of the combination on the safe. The scheme was working all right and the knob was nearly melted off when the current was shut off the railway circuit shortly after midnight. The thieves evidently knew what they were about, as they had even gone so far as placing a little pile of sand under the knob for the molten metal to fall upon and thus avoid setting fire to the floor. They would probably have succeeded in their attempt had the current supply lasted for a few minutes longer.

Our old-time, but not much esteemed friend, John W. Keely, has "exhibited" his motor again. There happened to be one capable electrician in the party, Mr. A. C. Brown, of the Western Union Telegraph Company. He was not fooled a moment. In an interview, Mr. Brown said:

Nothing that I saw would justify me in saying that any useful discovery in dynamics has been made. At no time did the motor, or "etheric engine," or whatever you may choose to call it, develop more than one-twentieth horse-power. In some of the printed reports of the test, I see that it is said as high as 10 horse-power was developed. That is not so.

When it came to an examination of the motor, we were stopped before we got very far. We were not allowed to find out, even if we could, just what it was that came from the "sympathetic generator," or to test the composition of the "vitalized disks." No examination was allowed of the composition of the "sensitized cartridges." How, then, was it possible for us to draw any conclusions as to the practical value of the motor? I saw nothing to convince me that it has a practical value. I can imagine that the "wheels went 'round" by some device such as the late Mr. Hermann might have conjured up. Mind you, I do not say that such is the case, but from all I saw it might have been.

Although a 30-year-old invention, this "motor" is evidently still without power—as it will be to the end of time.

THE INDEPENDENTS.

The telephone interests outside the control of the American Bell Telephone Company have effected two national organizations. One represents the operating telephone exchanges, and the other, to a considerable extent, the manufacturing interests. A full account of the proceedings at Detroit is presented in this issue.

After an animated convention, extending over two days, the delegates from the operating telephone companies elected a staff of intelligent and active officials and adopted a comprehensive constitution, under which it is expected to secure as members the entire opposition telephone organizations of the United States. The manufacturers also organized, and will no doubt work in harmony with the consumers.

Altogether, the independent interests are to be congratulated on the strength, ability and determination presented at this first convention.

PERSONAL.

Mr. Mark A. Replogle, of the Replogle Governor Works, Akron, Ohio, made a brief visit to New York city last week. Mr. Replogle reports a decided revival of water-power development in all parts of the country.

Mr. Samuel A. Duncan, of Pittsburgh, was a New York visitor last week, having just returned from an extensive trip South. Mr. Duncan is one of the active men connected with the Postal Telegraph company, and is now, after years spent in the electric lighting field, devoting himself entirely to his first love, the telegraph.

Mr. S. M. Bryan, the president of the Chesapeake & Potomac Telephone Company, Washington, D. C., is a gentleman of ability and energy, but when he tackled a bicycle in an unguarded moment he was so badly thrown that he traveled with the aid of crutches several days. Mr. Bryan's many friends throughout the telephone fraternity of the United States will be glad to learn that, on the 21st day of June, at 1.30 P. M., he was able to throw aside the crutches and proceed in a normal way.

Mr. W. A. Vail has accepted the position of superintendent of the Central Union Telephone Company, in charge of the Indiana division, with headquarters at Indianapolis. Mr. Vail for three years past has been special agent for the American Telephone and Telegraph Company (long distance), and is a widely known and successful telephone representative. He was one of the early men in the field, having been identified in a responsible way with the Bell Telephone Company, of Maine, in 1880, and afterwards general superintendent of the Metropolitan Telephone Company (now the New York Telephone Company). Mr. Vail is a thoroughly experienced telephone man, and the Central Union Telephone Company is to be congratulated on securing his services for the important territory he will control.

WESTINGHOUSE COMPANY'S ANNUAL REPORT.

FULL TEXT OF PRESIDENT WESTINGHOUSE'S REPORT TO THE STOCKHOLDERS—ANNOUNCEMENT OF A LARGE CONTRACT—A DIVIDEND DECLARED — BOARD OF DIRECTORS RE-ELECTED.

Your board of directors present herewith the balance sheet showing the financial condition of your company as of March 31, 1897.

Owing to the removal operations from the old into the new shops, your board of directors was unable to present a balance sheet for March 31, 1896, based upon actual values of inventories.

The class of electrical business conducted by your company has been in a depressed condition during the past two years, owing to the almost complete interruption in the building of new railways and new power stations. Notwithstanding these unfavorable conditions and the heavy charges to current expense account, due to the removal to the new works and the making of new tools, patterns, etc., the company's earnings have exceeded the amount required for the dividends on the preferred stock, which have been promptly paid.

By comparing the present balance sheet with that for March 31, 1895, it will be seen that there has been made a reduction in the surplus account of $1,577,735.93, due to amounts written off in connection with the disbandment of the old factories, the sale of obsolete tools, machinery and stock, depreciation of inventory, bad debts, the adjustment and settlement of old accounts, and the book loss from the sale of stocks and bonds owned by the company, and also the book loss resulting from the sale, at the price mentioned below, of $3,000,000, par value, of "assenting stock."

On June 4, 1896, your company authorized the increase of its capital stock from $10,000,000 to $15,000,000, and your board of directors effected a sale of $3,000,000, par value, of the new assenting stock thus authorized to the Security Investment Company, of Pittsburgh, which realized to the company $2,489,000, of which amount $1,260,000 was received in cash, $329,000 was represented by patents and property, and the remaining $900,000 in interest-bearing notes secured by collateral; $300,000 of such notes were payable July 5, 1897, and have been paid; $300,000 are payable July 5, 1898, and the remaining $300,000, July 5, 1899.

Pursuant to the terms of the contract with the General Electric Company, for the exchange of licenses under the patents of the two companies, of which you were notified by a circular letter dated April 2, 1896, your company has purchased outright for $216,600 the Tesla patents for multiphase-current motor, in order that both companies might manufacture apparatus covered by those patents without the payment of royalties, other than those provided for in the agreement between the two companies. For like reasons your company purchased, for $72,231.17, the entire capital stock of the R. D. Nuttal company, which has a complete workshop for its purposes, and manufactures trolleys for the General Electric Company and your company, and gears and other railway supplies for the general market. The stock purchased is considered fully worth its par value of $118,000. Your company also purchased for $58,500 and the transfer of certain patents acquired through its agreement with the Security Investment Company, 12,433 shares of the Electro-Magnetic Traction Company, out of a total issue of 20,000 shares.

The agreement between the General Electric company and your company has been in force a little over a year, and the wisdom and value of the union of patents has been fully established. The patents of the two companies, thus brought together, have a commercial value which can not be adequately appreciated by those not familiar with the electrical business. These patents are numbered by the thousand, and, within the field covered by the company's business, relate to every conceivable electric system and kind of apparatus to the minutest detail. Their present book value is less than the sum expended in acquiring and developing them. The terms of the contract between the General Electric Company and your company fix the respective values of the patents at 62½ per cent for the General Electric Company and 37½ per cent for your company. The patents owned by your company are carried at $4,689,080.89, or less than 37½ per cent of the aggregate book value of the patents of both companies. Many of these patents have already been sustained by the courts, while in numerous instances infringers, after being made acquainted with the situation, have agreed to cease infringing.

During the past year many valuable patents have been acquired in the interest of the two companies at moderate cost, while the expense of carrying on suits has been greatly less than the sum formerly expended by the two companies.

A liberal course is being pursued in the enforcement of these valuable rights, and there is reason to expect that the time is near at hand when the patent property now being managed as a common interest will be generally recognized as exceeding in value and importance that of any other manufacturing interest.

These items appear on the books at cost. It was the expectation of your board of directors that a large part of the bonds and stocks of lighting companies on hand could be disposed of from time to time, but there has been no market for the sale of such securities during the past two years. These stocks and bonds have, as a rule, increased in intrinsic value, and it is proposed to pursue the policy of selling them whenever advantageous terms can be secured.

It has not yet been possible to dispose of the old factories of your company and of the United States and Consolidated companies. It is expected that with the improvement of business a market will be found for these properties.

It is the hope of your board of directors that the proceeds of the sale of stocks and bonds and old factories will, in the near future, be sufficient to care for the indebtedness of the company, leaving the quick assets for the regular current business.

The utilization of water power, and its transmission by electricity, have given great prominence to the Tesla patents, which, together with numerous other patents controlled by your company and the General Electric Company, should insure to the two companies the sale of all the power-transmission apparatus used in this country.

About two years ago your company installed at Niagara Falls, for the Cataract Construction Company, three 5,000-horse-power generators, and in January of this year were awarded by that company the contract for five additional generators of the same capacity, which are now under construction.

Your company has also just been awarded a contract for 15 5,000-horse-power generators by the St. Lawrence Power Company, which is the largest single order yet given for power-transmission apparatus.

Your company should derive great benefit from the execution of this contract, since no other company has yet attempted work of this size and importance. The securing of these contracts was, without doubt, due to the success of your apparatus at Niagara Falls, and to the most complete facilities which your company now has at its new works, at East Pittsburgh, for the manufacture of large electrical units.

Your company has made marked progress in the development of apparatus for the operation of suburban and interurban trains on main railways, and it has installed at East Pittsburgh, on the tracks of the Pennsylvania Railroad, experimental apparatus, where important experiments are constantly being carried on. We believe your company is now more fully equipped and has better facilities for work of this kind than any other concern.

Your workshops at East Pittsburgh are in complete order, and have the advantages for manufacturing which it was contemplated they should possess. Its facilities, arrangements, machinery and tools enable it to undertake work of the largest character which may be proposed. All that has been said heretofore with reference to the property of your company at this place, and the opportunity it affords for economical operations, has been more than borne out by the facts. These works stand on your books at $2,769,886.26, of which $1,290,732.85 is for real estate and buildings, and $1,479,153.41 for machinery and tools, making an exceptionally low cost for works of such great capacity.

The engineers of your company have acquired a world-wide reputation in mechanical and electrical engineering, a fact well illustrated by the close copying by other manufacturers of plans, systems and designs which had their origin in your offices or works. The character of the apparatus turned out at your new works has given your company substantial trade advantages.

By order of the board,
GEORGE WESTINGHOUSE,
President.

Pittsburgh, Pa., June 23.

BALANCE SHEET, MARCH 31, 1897.

ASSETS:		
Cash in banks		$330,193 89
Bills receivable		43,207 09
Accounts receivable		1,604,547 19
Material in stock and in course of manufacture (at cost of labor and material)		1,636,612 33
Amounts advanced leased companies		569,766 56
Bonds (par value, $1,395,094.79)		1,352,655 31
Stocks (par value, $10,470,611.02)		4,612,223 87
Real estate and buildings, Pittsburgh.		455,115 71
New factory—land and buildings.	$1,290,732 85	
Less—First Mtg. on land and bldgs. (final payment due April 1, 1900). $325,000 00		
First Mtg. second purchase of land (due July 1, 1899) 59,300 00	384,300 00	
Total		906,432 85
Machinery and tools		1,479,153 41
Miscellaneous		286,306 40
Charters, franchises and patents		4,689,080 89
		$17,965,295 05
LIABILITIES:		
Accounts payable		$484,534 21
Bills payable, issued for merchandise.		207,151 12
Discount with collateral		1,399,506 89
Contract and contingent liabilities:		
Script dividend		194,560 00
Collateral trust bonds		590,000 00
U. S. E. L. Co.'s six per cent 15-year bonds, $50,000, payable annually. (Bills receivable under discount, $907,155 38.)		350,000 00
Capital Stock:		
Preferred, 79,921.06 shrs.	$3,996,053 00	
Assenting, 163,902.52 "	8,195,126 00	
Common, 2,934 "	146,700 00	
		12,337,879 00
(In treasury, 56,097.48 shares Assenting, and 78.94 shares preferred.)		
Surplus		2,401,664 28
		$17,965,295 50

The old board of directors was re-elected as follows: Charles Francis Adams, Lemuel Bannister, August Belmont, N. W. Bumstead, A. M. Byers, Marcellus Hartley, George W. Hebard, Henry B. Hyde, Brayton Ives and George Westinghouse.

On June 22 Treasurer Kobbé sent out this announcement:

At a meeting of the board of directors of the Westinghouse Electric and Manufacturing Company held this day, a regular quarterly dividend of one and three quarters per cent (1¾%) upon the preferred stock of the company was declared, payable July 1, 1897, to stockholders of record, the transfer books to close on June 25, 1897, at 3 P. M., and to open on July 3, 1897, at 10 A. M.

Electric Engineering and Supply Company Assigns.

The Electric Engineering and Supply Company, of Syracuse, N. Y., last week made an assignment to Benjamin Stoltz. The company was unable to meet its debts and, therefore, assigned. Its business was manufacturing and dealing in electric light and railway supplies, conducting business at 308-310 West Jefferson street. Mr. H. C. Hodgkins was president, and Mr. H. A. May, secretary. Messrs. Gorke and Hinds, who had been respectively secretary and superintendent of the company for some years, resigned their positions several months ago. Rumors affecting the credit of the company have been in circulation for a month past.

Death of E. E. Bogart.

Mr. Eugene Effingham Bogart, son of the late A. L. Bogart, died in New York city on June 24, as the result of injuries received by being thrown from a cable car in New York city on February 5 last. Mr. Bogart succeeded to the old established electrical business of his father, Abraham L. Bogart, who died suddenly on July 25, 1896. Since his father's death E. E. Bogart and his brother, A. Livingston Bogart, have carried on the business at the old stand, 22 Union Square. Mr. E. E. Bogart was a highly educated gentleman of fine character and considerable technical ability. The ELECTRICAL REVIEW extends its sympathy to his family in their bereavement.

The Brush Electric Company.

The apparatus of the Brush Electric Company has been known to the electrical field for over 20 years, and it is to-day popular and in demand. Mr. Charles F. Brush was fortunate in planning model apparatus at the outset—machines and lamps that seem to improve with age. The more recent development of the Brush dynamos, with capacities of from 55 to 300 2,000-candle-power lamps, has caused many lighting companies to change from small units to the larger dynamo with most satisfactory results.

The Brush Electric Company is also selling more of its widely known arc lamps than ever before in its history.

Suit on Paper Cable Patents.

The National Conduit and Cable Company, of New York city, on June 25 brought suit against the New York & New Jersey Telephone Company, of Brooklyn, N. Y., for alleged infringement of patents on the manufacture of paper-covered cables owned by the plaintiff. The telephone people do not seem to be worried over the matter, and deny that there has been any infringement.

The Stromberg-Carlson Telephone Apparatus.

When in the year 1893-94 the first Bell telephone patents expired, and one of the greatest inventions of modern times became partially public property, the country in a short time became flooded with a quantity of cheaply constructed, badly finished and often poorly designed apparatus, which found more or less ready purchasers, who, in their eagerness to obtain cheap telephones, did not always thoroughly investigate the merits of the goods offered, nor ascertain if the apparatus infringed unexpired patents controlled by the Bell company.

FIG. 1.—A STROMBERG-CARLSON TELEPHONE SWITCHBOARD.

Among the many manufacturers of telephone appliances who entered the field at that time, the Stromberg-Carlson Telephone Manufacturing Company, of Chicago, was one of the very few who did not rush blindly into the field with hastily made and untried apparatus, but systematically went to work designing and perfecting its appliances, believing that a telephone system could be developed which would in no way encroach upon existing companies' rights, and at the same time be as efficient as, or, in some points at least, superior to, the best instruments in use. To accomplish this without in any manner infringing existing patents would have seemed to be next to impossible to any one who had carefully looked into the telephone patent situation; nevertheless, the system and apparatus of the Stromberg-Carlson company are claimed to be the only ones on the market to-day absolutely free from even a taint of patent litigation. This, they think, is probably due to the fact that, in the development of the various appliances, every detail was most carefully investigated and existing patents minutely examined, producing devices that, as stated, not only overcame any patents not owned by the company, but in many cases accomplished the desired result in a far simpler and more efficient manner.

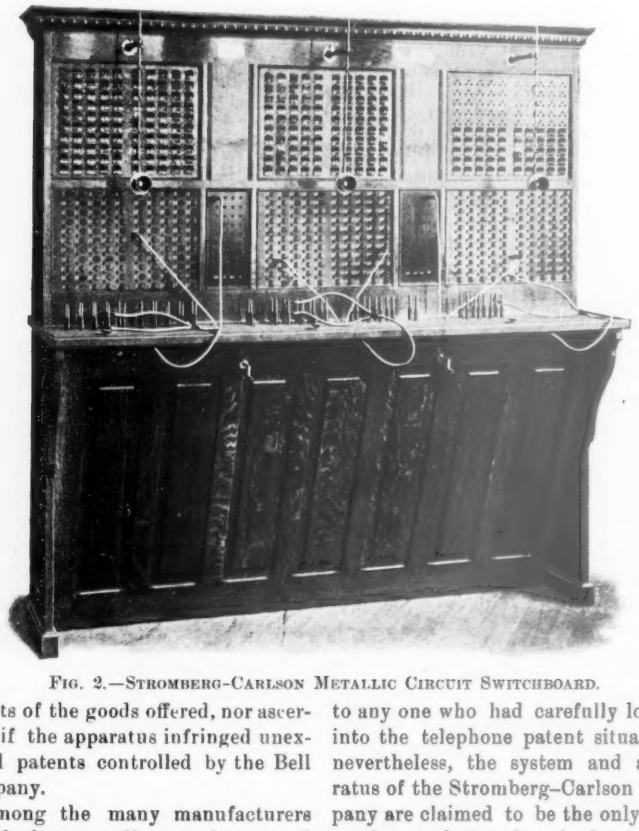

FIG. 2.—STROMBERG-CARLSON METALLIC CIRCUIT SWITCHBOARD.

While a detailed description of the company's various products would require more space than is within the scope of this article, a brief mention of the more interesting details of its appliances will not prove uninteresting to our readers.

The most important device in a telephone exchange is, of course, the switchboard. Upon its accuracy depends the efficiency of the service, and the simpler, surer and more reliable the board, the more favorably it will be considered by the exchange manager.

The illustration, Fig. 2, shows a 300-line board of the metallic construction. This is not only compact and handsome in appearance, but has incorporated in it several decided improvements over other types. One of the most important points consists in the ingenious manner in which the annunciator drops are used for clearing-out purposes. The drops consist of two coils, each with a primary of comparatively low, and a secondary of high, resistance. When connecting plug is inserted, the secondary is bridged, thereby cutting out the high resistance, but still leaving the circuit so that both drops are bound to respond to a ring-off. This is of particular advantage on large boards, as it gives the disconnecting signal to both operators and obviates the necessity of conversation between them.

It has often been questioned whether a satisfactory toll-line service could be maintained without using the bridging system, which by its advocates is claimed to be far superior to the series arrangement. This the company claims may be true theoretically. In the series system of the Stromberg-Carlson company, one subscriber can not put himself in communication with another without switchboard connection. This is accomplished in a most ingenious manner, by providing each subscriber's station with an alternating-current generator for calling purposes, while his call-bell responds only to direct-current impulses from the central office. In addition to the call-bells, each line has an automatic signal drop, showing what line is called. The board is so wired that metallic, common return or grounded lines may be connected.

Fig. 3 shows the standard wall set complete with backboard, magneto and self-contained "triplet," consisting of receiver, transmitter with induction coil and switch. In designing this self-contained "triplet set" the company had in view the re-equipment of exchanges, where very often it would be possible to utilize the same backboards, magnetos and batteries, and by substituting the combined receiver, transmitter with induction coil and switch, produce a complete and satisfactory working telephone. This can be used to re-equip any make of telephones.

The portable desk telephone, Fig. 5, is handsomely made of nickel-plated metal and is as light in weight as is consistent with substantial construction. The transmitter and receiver are the regular exchange parts, while the base contains the necessary

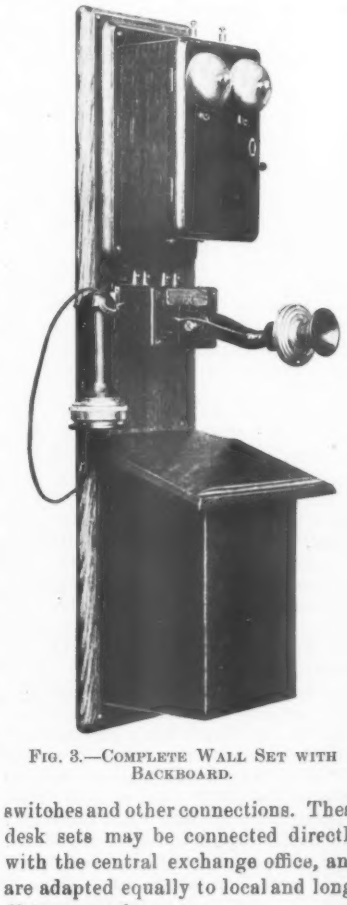

FIG. 3.—COMPLETE WALL SET WITH BACKBOARD.

switches and other connections. These desk sets may be connected directly with the central exchange office, and are adapted equally to local and long-distance work.

In its interior telephone system the Stromberg-Carlson company claims the most perfect inter-communicating system for offices, railroads, factories and insolated plants of every

description ever designed. It is claimed that nearly all other systems do not provide a reliable switching apparatus, and failure to replace the local switch or plug in the home number cuts out the station affected and renders the system valueless. In this system such neglect makes no difference whatever, for any station may be called at will, even though its local plug be misplaced, and finally, any number of people may communicate with each other simultaneously, and without interference, up to the full capacity of the plant; and any couple may, by secret device, render eavesdropping an impossibility—a feature peculiar to this system alone.

In business houses where a large number of stenographers are employed, much time is often taken up by the several stenographers being required to take dictation from several departments located at different parts of the premises. In such cases the stenographers' set, Fig. 7, will be found very useful, inasmuch as it permits the stenographer to remain under the supervision of a head stenographer, and yet to receive dictation from the various departments of the house. The convenience and desirability of a system of this kind, which can be relied upon, will be recognized at a glance by those who have need of stenographers' services, and is fast being adopted by wide-awake business men.

Those municipalities who desire to install a simple and efficient signal service for police patrol or fire-alarm purposes will be interested in the claim made by the Stromberg-Carlson company for its system.

A view of the signal box open is given in Fig. 4. It contains a well made clock movement which, on opening the door automatically, sends a calling signal and at the same time cuts in the receiver and transmitter.

There are no local batteries in the boxes, as current is sent from the central station, consequently there is no trouble from freezing, and, as both receiver and transmitter are impervious to moisture and not affected by variation in temperature, there is practically nothing to repair or inspect, except the line or central station batteries, thus reducing cost of maintenance to a minimum. Telephones of special design are being furnished for use in diving bells and for wrecking service generally.

In the very compact, portable telephone set shown in Fig. 8, the company is furnishing what promises to become a most convenient and necessary accessory to any rural, suburban or interurban railway where but few cars are upon the line. With each car provided with an instrument in case of accident, it is merely necessary to insert the connecting plug in a socket located in a small iron weatherproof box at intervals along the line, which puts it in instant communication with headquarters. Not only is the company equipping lines in this manner, but quite a number of sets have been sold, we are informed, to be used on hunting or shooting grounds, where a convenient number of plugs are placed, so that the pleasure party may, as it moves from place to place, still be able to communicate with the outer world if so inclined.

In conclusion, a few words about the inventors and designers of the apparatus herein described will not come amiss. Mr. Alfred Stromberg and Mr. Androv Carlson have been engaged in the telephone business from its early days as practical experts, and have a most comprehensive knowledge of the telephone practices of this country as well as of Europe. Both have that peculiar inventive faculty, mechanical dexterity and painstaking care in mechanical details that make the Swedish name almost equal to the Yankee for ingenius contrivances, while, perhaps, surpassing it for workmanship and thoroughness of construction.

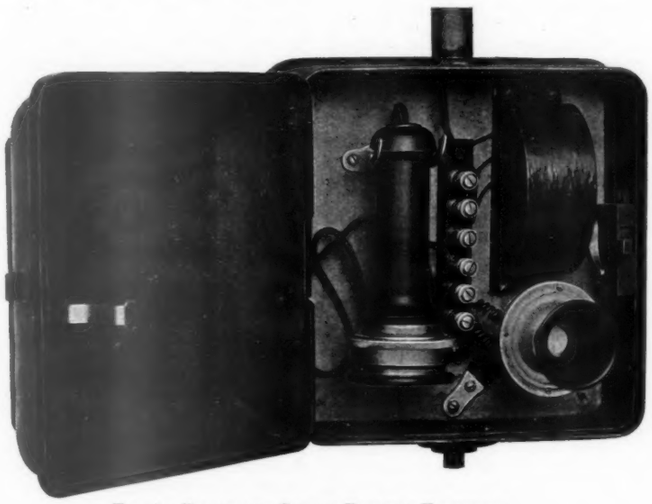

FIG. 4.—POLICE AND STREET RAILWAY TELEPHONE.

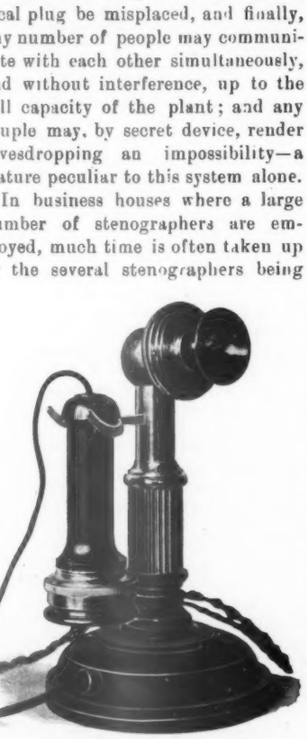

FIG. 5.—DESK TELEPHONE SET.

LITERARY.

Secretary George C. Maynard has just issued the second instalment of the records of the Telegraphic Historical Society of North America, including pages 126 to 165. This instalment contains a report of the society's meeting held at Washington, D. C., May 5, 1897, an account of which appeared in the ELECTRICAL REVIEW at the time.

FIG. 6.—INTERCOMMUNICATING SWITCHBOARD.

FIG. 7.—STENOGRAPHER'S SET.

In *Municipal Affairs* for June, published by the Reform Club, of New York city, are two articles on municipal ownership of gas plants. The affirmative side is taken by Hon. Edward M. Grout in an essay entitled "New York Should Own the Gas Supply." Mr. Allen R. Foote, as usual, takes the negative position on this question in "No Government Should Operate an Industry—A Reply." Mr. Grout gets back at Mr. Foote in "A Rejoinder."

The text of the directory refers to the maps, giving railroad connections, distances, etc.

The volume also contains lists of the dry goods commission merchants in the principal cities, lists of manufacturing clothiers, suit and cloak-makers, principal jobbers and large retailers buying from first hands; also lists of dealers in raw material in the principal cities, together with carefully classified index of builders of mill machinery and dealers in supplies.

FIG. 8.—PORTABLE TELEPHONE SET.

The *Textile World's* directory of the mill trade and of large buyers of textile fabrics, just issued, is a book of 360 pages, packed full of information concerning the textile industry and collateral branches. It contains a complete directory of all the textile establishments in the country, with detailed information concerning each mill, what it makes, capacity, etc. All the mills in a city or town are grouped together according to location, while in another part of the book, alphabetically arranged, the different kinds of mills, viz., cotton mills, woolen mills, etc., are grouped by themselves.

A unique feature of this directory is the textile maps of the principal manufacturing States. These maps show the location of cities and towns, where there are textile establishments.

Price, in board covers, $3; paper covers, $2. The *Textile World*, publishers, 620 Atlantic avenue, Boston, Mass.

The Baltimore Traction and the City & Suburban companies, of Baltimore, Md., recently voted to consolidate into the Baltimore Consolidated Railroad Company, which has been organized with a capital of $10,000,000.

INDEPENDENT TELEPHONE ASSOCIATION OF THE UNITED STATES OF AMERICA.

(Continued from page 309.)

E. C. Pierce, Barberton, Ohio.
A. B. Coon, Marengo, Ill.
T. A. Rockwell, Oshkosh, Wis.
Thos. Fricker, Ashtabula, Ohio.
Wm. G. King, Chardon, Ohio.
C. D. Terrell, Jackson, Miss.
W. L. Crissman, Cedar Rapids, Iowa.
L. R. Heath, Mercer, Pa.
F. L. Beam, Mount Vernon, Ohio.
H. D. Critchfield, Mount Vernon, Ohio.
Jas. B. McKell, Chillicothe, Ohio.
Chas. D. Duncan, Chillicothe, Ohio.
Peter White, Ishpeming, Mich.
H. C. Hedges, Lansing, Mich.
Geo. W. Finch, Escanaba, Mich.
D. A. Reynolds, Jackson, Mich.
Geo. Beaton, Detroit, Mich.
E. H. Andress, Lafayette, Ind.
John McGregor, Madison, Ind.
L. A. Frazee, Connorsville, Ind.
Geo. W. Beers, Fort Wayne, Ind.
C. M. Zion, Lebanon, Ind.
J. H. Murphy, New Albany, Ind.
C. M. McCabe, Covington, Ind.
Delos Thompson, Rensselaer, Ind.
R. F. Blount, Wabash, Ind.
Jesse Weik, Greencastle, Ind.
Hugh Dougherty, Bluffton, Ind.
W. J. Vesey, Fort Wayne, Ind.
J. L. Stone, Rushville, Ind.
Charles Flowers, Detroit, Mich.
F. M. Ash, Dearborn, Mich.
J. D. Ware, Grand Rapids, Mich.
C. P. Collins, Wayne, Mich.
Hugh O'Connor, Plymouth, Mich.
W. C. Sterling, Jr., Monroe, Mich.
W. C. Sterling, Sr., Monroe, Mich.
Geo. M. Connor, Mt. Clemens, Mich.
John T. Holmes, Port Huron, Mich.
Justin R. Whiting, St. Clair, Mich.
Dr. J. Williams, Jr., Adrian, Mich.
Wm. H. Blake, Cheboygan, Mich.
H. H. Hatch, Pontiac, Mich.
E. H. Parker, Flushing, Mich.
Frank A. Vernor, Memphis, Mich.
J. H. Fildew, St. Johns, Mich.
G. A Weed, Lake Odessa, Mich.
E. S. Rogers, Owosso, Mich.
W. O. King, Corunna, Mich.
I. N. Starkweather, Northville, Mich.
V. O. Whipple, Northville, Mich.
A. I. McLeod, Ypsilanti, Mich.
W. L. Holmes, Detroit, Mich.
T. F. Ahern, Detroit, Mich.
J. G. Johnson, Three Rivers, Mich.
W. H. Gilbert, Saginaw, Mich.
S. G. Higgins, Saginaw, Mich.
Chas. E. Bell, Everett, Mich.
Geo. D. Bouton, Ann Arbor Mich.
A. J. Little, Battle Creek, Mich.
Jos. Walz, Walz Station, Mich.
W. H. Butler, Ravenna, Ohio,
Dan A. Mossman, Huntington, W. Va.
C. R. Savidge, Sunbury, Pa.
H. K. Cole, Owensboro Ky.
S. T. Slade, Oskaloosa, Iowa.
H. C. Young, Columbia, Pa.
I. A. Lumpkin, Mattoon, Ill.
Louis Feder, Lima, Ohio.
W. B. Seaton, Ashland, Ky.
D. C. Dow, Cobleskill, N. Y.
Elmer E. Summey, Utica, N. Y.
Tom A. Marshall, Keithsburg, Ill.
J. M. Davison, Brewster, Ala.
F. L. Hawley, Florence, Ala.
A. C. Savidge, ——, Pa.
W. H. Oplinger, Wadsworth, Ohio.

MANUFACTURING COMPANIES.

Moon Manufacturing Company, Chicago, Ill., H. E. Procunier.
North Electric Works, Cleveland, Ohio, Chas. H. North.
Whitman & Couch, Boston, Mass., S. H. Couch.
American Electrical Company, Chicago, A. H. Gehle.
Smith & Patterson, New York, L. P. Smith.
Western Telephone Construction Company, Chicago, Kempster B. Miller and Chas. P. Platt.
Standard Telephone Company, Madison, Wis., H. A. Taylor and J. J. Nate.
Phœnix Interior Telephone Company, New York (John S. Scofield, dealer, Philadelphia), W. D. Bernard.
Stromberg-Carlson Manufacturing Company, Chicago, A. B. Cotton.
Connecticut Telephone and Electrical Company, E. C. Wilcox.
Allan Hussey Manufacturing Company, Chicago, A. R. Hussey.
Farr Telephone Construction and Supply Company, R. J. Cram.
Rawson Electric Company, Rawson, Ohio, S. B. Rawson.
Western Signal Company, Chicago, B. F. Stewart.
Weaver General Electric Company, Wadsworth, Ohio, R. F. Weaver.
Garl Electric Company, Akron, Ohio, M. Garl.
St. Louis Electrical Supply Company, St. Louis, Mo., E. Ruebel.
Standard Underground Cable Company, F. S. Viele.

After more or less animated discussion, a motion was finally carried that the report of the committe be adopted, after which the convention adjourned till 7.30 P. M. Before adjournment, President Thomas announced that a complimentary boat ride had been tendered to the delegates and their friends and families by the Detroit Telephone Company, the ride to take place on Wednesday at 2 P. M., on steamer "Sappho."

TUESDAY EVENING SESSION, JUNE 22.

The convention reassembled at 8 P. M., and the temporary executive committee presented its report on a constitution through Chairman H. D. Critchfield, of Newark, Ohio.

The constitution in Article I states the name of the association as the "Independent Telephone Association of United States of America," and then states the object to be the protection of all independent telephone companies, the establishment of reasonable toll rates and the extension of inter-city communication. The membership was fixed to those exchanges which paid $10 and the assessments as provided.

The officers were the usual ones, with an advisory board of nine, two of whom shall be the president and secretary. The president shall receive a salary not to exceed $2,500 and expenses. The secretary's duties are the usual ones of that office, with a salary not to exceed $1,000 and expenses, and must give a bond to be approved by the advisory board. The treasurer's salary shall not exceed $700 and expenses, and he also must give bonds. The advisory board was given power to handle the finances, make assessments, transfer money from one fund to another, and direct the officers when the executive committee is not in session.

Before the constitution was acted upon a motion was adopted directing the committee on credentials to place upon the list the names of all delegates, with or without credentials, who stated on his honor that he represented an exchange. This brought out 22 more exchanges as members of the convention.

A motion to take up the constitution, article by article, was severely objected to by Mr. McLeod and others, but was finally carried.

The second article, on the object of the association, as above stated, brought several men to their feet to ask if there were any Bell company men in the hall or others not entitled to vote, and a motion by I. A. Lumpkin, of Mattoon, Ill., was adopted, sending everybody to the rear of the hall, and then the delegates to come forward and take seats as their names were called by the chairman of the committee on credentials.

Two doorkeepers were appointed to keep the friends of the Bell company and other unauthorized persons outside the pale and to eject any such that might have got in.

A. V. Dively and the other two Pennsylvania men representing the 27 exchanges, refused to take seats with the convention, as they were not allowed to have the 27 votes they claimed. A motion was adopted offering the Pennsylvania men a seat with the body, to represent their own exchanges, but the invitation was declined until they could come in as they were instructed.

It was reported that W. C. Ryan, of Hampton, W. Va., was a Bell employé, and the committee sent a telegram to Hampton, and learned that he was the accredited representative of the independent exchange there.

Alex. McLeod questioned the standing of Jas. E. Keelyn, of Chicago. The other representative of his company withdrew in his favor, so that Mr. Keelyn's name was substituted.

When the clause was reached providing for the raising of a defense fund by an assessment of 50 cents per telephone and 25 cents per mile of toll line, W. L. Holmes, of Detroit, moved to amend to 10 and 5 cents. Secretary Critchfield, of the committee, replied that the figures of the committee would not raise to exceed $25,000 to $30,000 for a fund to meet a concern that is ready to expend $150,000 to $200,000 at any stage of the proceedings. After considerable discussion the 10-cent amendment was voted down, leaving the rate of assessment 50 and 25 cents, as reported by the committee. Upon this Mr. Holmes, of the Detroit Telephone Company, stated that his company was not prepared to enter any association which contemplates a lawsuit. He said his company did not fear any lawsuit, and started to explain at length his company's position in the matter, but was promptly declared out of order.

"The Detroit Telephone Company does not propose to join in any litigation," said Mr. Holmes later. "We have nothing to litigate. Our transmitter is entirely different from the one in use by the Bell company, and is our own patent. We are absolutely independent of the Bell people, and we will not put up any money to help fight battles in which we are not interested or for protection that we do not need. My idea was to form a commercial organization, which would wield an influence in securing favorable telephone legislation, in developing toll lines, etc. Now that a constitution is practically adopted which makes the chief object of the association litigation, the Detroit Telephone Company will not be in it. We shall not do anything to disrupt the convention, but, when the time comes for signing articles, we will quietly drop out."

The clause providing for the admission to honorary membership of manufacturers upon their contributing to the funds, but to have no vote, provoked a strong protest from the manufacturers, whose feelings were said to be that they were willing to join hands with the operators of exchanges for the common good of all and to meet the common enemy, but they should have a vote and a voice in the management of the association. The section as reported was adopted, but created strong objection. Mr. H. A. Taylor, representing the Standard Telephone and Electric Company, of Madison, claiming that it was assessing taxation without granting representation, as manufacturers and dealers were supposed to contribute the funds of the association. He wanted this clause referred to the executive committee, and it was so ordered by a vote of 48 to 31.

A motion made to adjourn when 12 o'clock struck was defeated, on a statement that 10 minutes more would dispose of the constitution, and the adoption of the remainder of its provisions was proceeded with.

It was 12.20 in the morning when the reading of the constitution was finished and the convention adjourned until nine o'clock of the same morning, June 23.

WEDNESDAY MORNING, JUNE 23.

Convention called to order by Chairman Thomas, who asked for report of special committee on Article VIII of the constitution. This caused the discussion to begin at a lively rate.

This is the article that regulates the number of votes to be controlled by members. The committee's amendment would grant each member one vote for every 500 telephones in actual operation, and one vote for a major fraction of that number. A motion by W. C. Sterling, Jr., of Monroe, to make the basis of votes 100 'phones was lost.

Judge Hatch again brought up the question of admitting to membership and the privilege of voting stockholders in telephone exchanges who are also interested in manufacturing telephone appliances, and motions and amendments came thick and fast.

Judge Hatch finally withdrew his first motion and moved to refer report back to committee with instructions to remove all disqualifications against manufacturers who had regular exchange qualifications.

Mr. Critchfield said hardly a manufacturer could be found who was not also interested in one or more exchanges.

Mr. Harper wanted manufacturers limited to only one vote under any circumstances; thought this would meet the danger of any manufacturer swamping them with proxies. Mr. Dougherty pointed out that such movement would not limit the manufacturer who would be represented by his own appointees, even if he had only one vote for himself. Motion to lay on table was lost and Articles III and VIII were referred back to committee for immediate action during a recess. After recess committee reported change of Section I of Article III, so that payment of membership fee and signing of constitution would entitle members to vote at election of officers, but not thereafter.

Article VIII was amended by striking out the objectionable phrase, to the effect that no member should be represented by any one interested in any way in manufacturing.

Report of committee as amended was carried unanimously.

The motion to adopt the report of the committee as a whole was then made, and as soon as "question" was called Mr. W. L. Holmes took the floor, protesting against several features objectionable to the Detroit Telephone Company, especially the heavy taxation and the large salaries of officers.

The vote on adoption of the constitution was taken, and while the ayes carried it, the opposition was sufficiently strong to reveal a large dissenting element.

On motion of A. I McLeod each State represented in the hall reported to the secretary the names of two representatives to be members of the executive committee. The members thus reported were accepted as the executive committee for the ensuing year.

The list is as follows:

Dan A. Mossman, Huntington, W. Va.
J. M. Payne, Charleston, W. Va.
H. D. Critchfield, Mt. Vernon, Ohio.
Thos. Fricker, Ashtabula, Ohio.
Elmer E. Summey, Utica, N. Y.
D. C. Dow, Cobleskill, N. Y.
F. C. Manning, Sumpter, S. C.
R. B. Libby, Charleston, S. C.
R. J. Jennie, Pine Bluff, Ark.
W. N. Gladson, Fayettsville, Ark.
V. L. Terrell, Meridian, Miss.
C. D. Terrell, Jackson, Miss.
C. E. Fink, Westminster, Md.
Edgar L. Miller, Frederick, Md.
T. J. McAdoo, Grimsboro, N. C.
L. A. Carr, Durham, N. C.
J. M. Davison, Ala.
F. L. Hawley, Florence, Ala.
J. C. Duncan, Knoxville, Tenn.
G. L Hardwick, Cleveland, Tenn.
W. B. Seaton, Ashland, Ky.
H. K. Cole, Owensboro, Ky.
C. L. Pohlman, Elsworth, Kas.
Louis Feder, Leavenworth, Kas.
T. H. Johnson, Sioux City, Iowa.
S. T. Slade, Oskaloosa, Iowa.
Samuel A. Harper, Madison, Wis.
Thomas A. Rockwell, Oshkosh, Wis.

Thomas A. Marshall,
Dr. I. A. Lumpkin, Mattoon, Ill.
S. G. Higgins, Saginaw, Mich.
Geo. W. Finch, Escanaba, Mich.
J. L. Hone, Rushville, Ind.
Hugh Dougherty, Bluffton, Ind.
S. A. Duvall, Richmond, Va.
W. K. Lankford, Charlottesville, Va.
H. C. Young, Columbia, Pa.
C. R. Savidge, Sunbury, Pa.

The duties of the temporary executive committee having been completed, it was discharged and a vote of thanks recorded for the committee's faithful services and untiring devotion in accomplishing so much in the limited time at its disposal.

An adjournment was then taken until seven o'clock, Wednesday night.

At two o'clock in the afternoon the delegates boarded the steamer "Sappho" as guests of the Detroit Telephone Company. A substantial lunch was served and the afternoon spent in riding up and down the river, enjoying the beautiful scenery, and especially the cooling breezes, which gave relief from the somewhat oppressive heat of the city.

WEDNESDAY EVENING SESSION, JUNE 23.

Owing to some delay on the part of the executive committee, it was nine o'clock before the convention was called to order and report of executive committee, which had been in session during the afternoon, received. Mr. Harper, of Wisconsin, announced selection of advisory board, consisting of Judge Savidge, of Pennsylvania, president; Mr. Harper, Wisconsin, secretary, and Messrs. Critchfield, Ohio; Dougherty, Indiana; Duncan, Tennessee, Miller, Maryland, and Higgins, Michigan.

Chairman Thomas announced that the manufacturers' association had been in session all day and appointed a committee to meet the advisory board some time during the following week and confer with it on matters of mutual interest.

The nomination and election of permanent officers of the organization was next proceeded with, the first step being to nominate and elect Judge J. M. Thomas by acclamation. President Thomas replied in a few well chosen and appropriate remarks of thanks, asking the hearty co-operation of the association, and predicting that it would not prove a failure, but that, if they continued to stand together in the future as they had done so far, victory would be assured.

The following officers were also elected by acclamation:

First vice-president, Col. H. C. Young, Columbia, Pa.

Second vice-president, E. K. Himes, Oskaloosa, Iowa.

Third vice-president, Thos. Fricker, Ashtabula, Ohio.

Secretary, W. J. Vesey, Fort Wayne, Ind.

First Assistant Secretary, G. W. Beers, Fort Wayne, Ind.

Second Assistant Secretary, D. C. Dow, New York.

When it came to the nomination of treasurer, Mr. Blow, of Tennessee, proposed the name of L. A. Carr, of Durham, N. C. and was followed by Mr. Tom Marshall, who, in glowing terms, urged the fitness of Dan A. Mossman, of Huntington, W. Va., for the position. Mr. Harper, of Wisconsin, next called attention to the advisability of dividing the offices a little better from a geographical standpoint, and, in an enthusiastic manner, put forward the name of Frank W. Hoyt as a candidate.

According to the constitution, the election of treasurer was proceeded with by ballot, which resulted in Mr. Carr receiving the largest number of votes, when the chair announced the election of L. A. Carr as treasurer.

It was not until a vote of thanks had been extended to the Detroit Telephone Company for the splendid and munificent manner in which it had taken care of and entertained the delegates, and several minor points had been disposed of, preparatory to a final adjournment, that Mr. Harper, of Wisconsin, caused somewhat of a commotion by questioning the legality of Mr. Carr's election, claiming that he had not received a majority of the votes cast. After considerable discussion, which at one time threatened to prolong the session considerably, Mr. Critchfield, of Ohio, appealed from the decision of the chair, and upon a vote being taken the chair was not sustained. Accordingly new ballots were prepared, a new vote was taken, which gave Mr. Carr 27 votes as against 13 for Mr. Mossman and five for Mr. Hoyt. The chair then announced the election of Mr. Carr a second time, and the convention adjourned *sine die*.

The constitution as adopted will appear in full in the next issue of the ELECTRICAL REVIEW, with additional news of the convention.

The Telephone Manufacturers.

The manufacturers of telephones, independent of the Bell interests, held an enthusiastic and harmonious meeting at Detroit, July 23, and organized an association to protect and promote their interests as manufacturers and the interests of the users. The following officers were elected unanimously:

President, H. A. Taylor, Standard Telephone and Electric Company, Madison, Wis.; vice-president, S. B. Rawson, Rawson Electric Company, Elyria, Ohio; secretary and treasurer, J. Harry Lee, Viaduct Manufacturing Company, Baltimore, Md.

An executive committee was formed, consisting of one member from each concern represented in the association.

Ample means were pledged to carry out the objects of the association and carry on any litigation brought against and repel all attacks upon the independent telephone business of the country.

The meeting was held behind closed doors, and no detailed report of the proceedings of the association was made public.

A NEW HORSELESS CARRIAGE.

PROF. ELIHU THOMSON SAID TO HAVE COMPLETED HIS MOTOR FOR VEHICLE PROPULSION.

It has been known to the friends of Prof. Elihu Thomson, the eminent electrician, of Lynn, Mass., that he has been at work for two or three years past experimenting on a motor to propel carriages. Professor Thomson tried various elements, such as gas and gasoline, and various oils, but finally returned to his first love, the electric motor, and while the experiments have been conducted with much secrecy in temporary buildings near the works of the General Electric Company, in Lynn, it is now understood that the perfected electric carriage will shortly be in readiness for public use.

The motors are to be placed on the rear axle of the wagon, and a speed of 20 miles an hour can be easily maintained. The electricity will be supplied from a storage battery of greatly reduced weight.

The motor is light, and the steering attachment is to be connected with the front wheels. Simplicity and durability are the prevailing characteristics of the mechanism. Mr. Lemp assisted Professor Thomson in his experiments.

TELEPHONE CONVENTION NOTES.

THE INCIDENTS, EXHIBITS AND GOSSIP OF THE GATHERING OF TELEPHONE MEN AT DETROIT LAST WEEK.

From the list of manufacturers given elsewhere it will be noticed that they fully appreciated the importance of this initial convention, and of the necessity of being personally on the ground so as to come in touch with the various users of telephone apparatus. A number of them had interesting exhibits, part of them at the Cadaillac Hotel and others at the Russell House, the attendance being about equally divided between those two famous hostelries.

The American Electric Telephone Company, at parlor G, of the Cadaillac, showed a complete line of its products, including two 100-drop switchboards of its latest type, containing self-restoring drop, self-restoring ring-off and the rapid-ringing device. The feature of each drop and jack being self-contained in a hard rubber case, so as to make an exchange of drops a matter of barely a minute, was much admired and favorably commented upon by the many visitors. A number of finely finished wall sets in the company's different styles, including the long-distance, as well as exchange type, telephone, were also exhibited in working order, as well as desk sets and other accessories, all of which were finished in that excellent mechanical manner for which this company's products are fast becoming famous. President P. C. Burns, manager H. C. Dodge, assisted by Mr. Ed L. French, of the company's staff of experts, were in attendance and never tired of explaining the many meritorious features of the American apparatus to the throng of interested spectators.

In Parlor D of the Cadaillac Hotel, the Western Telephone Construction Company had placed two of its latest type switchboards, one of 200 drops capacity and another of one-half that size. Various designs of long-distance as well as regular exchange wall sets were arranged around the room, supplemented by swinging-arm 'phones, desk sets, cabinet set, repeating coils, transfer boards; in fact, everything requisite to the complete equipment of an exchange. Some of the wall sets were finished in cherry, mahogany and other fancy woods, and were much admired. In addition to President J. E. Keelyn, who was one of the most sought-after individuals at the convention, the company's interests were well looked after by Messrs. K. B. Miller, Chas. B. Platt, W. D. Barnard, J. A. Russell and the ubiquitous J. G. Nolen.

The Keystone Telephone Company, of Pittsburgh, had headquarters in Room 12, where manager J. G. Ihmsen and secretary Burt Hubbell had an attractive exhibit of a general line of telephones, switchboards and supplies. A very compact lineman's testing set attracted much attention by the ingenious manner in which the magneto, transmitter and telephone had been arranged, so as to occupy the least possible space.

The St. Louis Electrical Supply Company did not exhibit any of its many telephone specialties, but President Ruebel was in attendance and took an active interest not only in the proceedings of the exchange convention, but also in the manufacturers' meetings. It is the company's intention to still more enlarge its manufacturing facilities in the telephone line, and Mr. Ruebel's somewhat hurried departure for Cleveland after the convention will probably result in some large contracts.

Among the more prominent visitors who seemed deeply interested in all the speeches and proceedings were Judge C. H. Aldrich, of Chicago, who was Solicitor-General under President Harrison, and Col. S. S. Stout, who, it will be remembered, so successfully defeated the Watson and Roosevelt patents. In this connection, and at this time, it is interesting to learn of the remarkable accuracy with which Colonel Stout predicted, in 1895, the nature of the Supreme Court's decision in the Berliner case, as well as the line of action pursued by the Bell company. In a letter to one of his clients, dated June 24, 1895, Colonel Stout says:

"* * * In fact, the court did not sit on that day, and I had to content myself with a study of the case from the records, as appealed. The result of this study was to confirm my already formed opinion that there was only one question properly before the court, and that was *whether or not the American Bell company had resorted to fraud for the purpose of detaining the Berliner application in the Patent Office.* * * * The 1891 Berliner patent can not be considered as having been litigated in any sense, and is no more to be respected than a patent issued yesterday."

The Stromberg-Carlsen company, in Parlor 228, had a complete exhibit of telephone apparatus, some in practical operation. The company's products are fully described in this issue of the ELECTRICAL REVIEW. Secretary A. B. Cotton and Mr. Henry Shafer looked after the company's interests.

The interests of the American Electrical Works were properly looked after by Mr. E. H. Hammond, of the Chicago office, who saw to it that each delegate was properly supplied with a descriptive price list of the company's products.

The genial Dan Hemingray, of the well known glass company bearing his name, was in attendance and shook hands with the many supply men, who are all carrying the company's goods.

The exhibit of the Williams-Abbott Electric Company, in Parlors 1 and 2 of the Russell House, showed in a striking manner the advance attained in the manufacture of such necessary adjuncts as telephone magnetos and calling or signaling apparatus in general. One of the most unique features in their bells consists of the tri-polar ringer; that is, one piece of magnet steel bent into shape and so magnetized that a consequent pole is situated directly over the vibratory armature of the ringer, while the two other poles are attached to the base or yoke of the ringer, and thus form a duplex magnetic circuit, i. e., a separate magnetic circuit for each ringer core. The advantage of this construction is that the power of attraction, as well as that of repulsion, is utilized, which results in a ringer that is practically twice as efficient as any other known form. This feature, we are informed, is fully covered by patents, which the company is prepared to fully enforce.

In connection with the ringer, the company has recently placed upon the market a generator equally ingenious and efficient. One of the most prominent features of this generator, as well as of this company's apparatus in general, is the high grade of mechanical construction, coupled with thoroughly modern electrical design.

It is needless to say that the finish of these goods carries out in a fitting manner the company's idea of a first-class product.

This company, we learn, is not only well officered, but has surrounded itself with the best of talent necessary to the successful operation of an electrical manufacturing business. Messrs. Sam'l D. Latta, president; J. A. Williams, electrical engineer; and

(Continued on page X.)

ADVANCE INFORMATION

New Electric Railways.

NEW ORLEANS, LA.—The Orleans & Jefferson Railway Company has been incorporated by Wm. R. Hall, president; Robert R. Zell, vice-president and engineer; Cyrus B. Buchanan, secretary; to build an electric railway line on Napoleon avenue. Capital stock, $250,000.

BIRMINGHAM, ALA.—The Birmingham Electric Railroad Company has commenced work of changing its Ensley division for the use of electric motors.

JACKSON, MISS.—C. W. Howard, of Chattanooga, Tenn., has been granted franchise for an electrical railway line in this city. The franchise covers six miles of street and includes an electric light plant.

BEAUMONT, TEX.—S. M. Peters, R G. Jenkins and others are interested in the construction of an electric street railway, and have applied for franchise.

ATLANTA GA.—The Atlanta & Douglasville Railroad Company has been granted a charter for the purpose of building an electric railroad between the two towns.

STAUNTON, VA.—The Basic City, Bridgewater & Piedmont Railroad Company contemplates construction of an electric railroad between Staunton and Basic City, Va.

BROOKLYN, N. Y.—The Brooklyn City & Newtown Railroad Company, known as the DeKalb avenue road, has made arrangements to extend its lines. One new branch is to extend from DeKalb and Wyckoff avenues to the city line, and another branch from Wythe avenue on Rush street to Kent avenue, Division avenue, Havemeyer street and Broadway.

ALBANY, N. Y.—The Greenbush & Nassau Railroad Company has been granted permission to construct an electric road from Rensselaer to Nassau in Rensselaer County.

HAMILTON, OHIO—M. O. Burns, City Clerk, can give information concerning construction and operation of street railway route No. 4.

OXFORD, ME. — The Oxford & Welchville Electric Railroad; work has commenced. It is expected to be in running order September 1. The road will be about three miles long.

WASHINGTON, D. C.—The Metropolitan Railroad Company has commenced work on its Eighteenth street extension, which will be about one mile long. The underground conduit system is to be used.

NORFOLK, VA.—J. G. White & Company, of Baltimore, contractors for the electric road between Portsmouth and Port Norfolk, have commenced construction work on this road, which will be three miles long. It will be operated by trolley.

RIVERHEAD, L. I.—The Riverhead, Quogue & Southampton Railroad Company will extend its trolley line to Sag Harbor. This will make the line complete from Sag Harbor to Orient Point, and will extend over 50 miles.

COLUMBUS, OHIO—The Cleveland & Akron Suburban Electric Railway Company has been incorporated, with a capital of $500,000, by Harry C. Mason, William C. Gayer, Dr. J. C. Fritch, J. A Spitzig and Frederick L. Taft.

MARCELLUS, N. Y.—A company has been incorporated to build an electric railroad from the Central station at this place to the village, a distance of two and one-half miles.

WASHINGTON, D. C.—The Capital Railway Company has decided to construct two branch lines in the suburbs, and has made arrangements to issue $300,000 in bonds for this purpose.

Electric Light and Power.

GLENVILLE, OHIO—Z. W. Morris, Village Clerk, can give information concerning lighting of St. Clair street with electricity.

BRENHAM, TEX.—The Brenham Compress Oil and Manufacturing Company contemplates increasing its electric light plant; will probably want 3,000-light outfit, and may want estimates on same.

PULASKI, VA.—The Pulaski Electric Company has been granted a franchise for the erection of an electric light plant, work on same to be commenced immediately.

JACKSONVILLE, TEX.—J. B. Roberts has been granted a franchise for the establishment of an electric light plant.

TOLEDO, OHIO—The Hotel Madison will put in a complete electric light plant.

FITZGERALD, GA —Address the Mayor concerning erection of an electric light plant.

PROVIDENCE, KY.—An electric light plant will shortly be established.

BROOKHAVEN, MISS.—Address the Mayor concerning erection of electric light plant, for which $40,000 worth of bonds will be issued.

JACKSON, MISS.—C. W. Howard, of Chattanooga, Tenn., can give information concerning proposed construction of an electric power-house.

ST. LOUIS, MO.—The Imperial Electric Light, Heat and Power Company has been organized, with Charles Boettcher, president; D. H. Dougan, secretary-treasurer, and E. G. Bruckman, general manager, for the erection of an electric light plant; capital stock, $1,000,000.

SAVANNAH, GA.—The Edison Electric Illuminating Company has been organized, with George J. Baldwin, president; Charles A. Stone, vice-president; Edwin S. Webster, treasurer, and W. W. Mackall, secretary, to do a general power and illuminating business.

WATSONTOWN, PA.—The Watsontown Electric Light Company has been incorporated by J. W. Morris, John Flanagan, T. W. O'Brien, George W. Beers, A. M. Dimmick; capital stock, $15,000.

WALKER, MINN.—The Village Clerk may give information concerning establishment of electric light plant.

CAREY, OHIO—A new electric light plant will be immediately established. About $10,000 worth of bonds will be issued for that purpose.

ST. PETER, MINN.—An electric light plant is to be put in the Rochester Hospital.

FOSSTON, MINN —An electric light plant will be established.

STARKE, FLA —The Mayor may be addressed concerning the erection of an electric light plant.

BLOWING ROCK, N. C.—The Morganton & Blowing Rock Electric and Improvement Company contemplates the erection of an electric light plant.

MAGNOLIA, MISS.—The Magnolia Gas and Light Company has been granted franchise for the erection of electric light plant and construction of waterworks.

EASLEY, S. C.—B. C. Johnson, superintendent Easley Oil Mill, may be addressed concerning electric light plant.

HATBORO, PA.—A 20-year franchise has been granted to a company of local capitalists to erect and operate an electric light and water plant in the borough. The cost of the proposed improvement will be about $25,000.

BROOKINGS, S. D.—S. E. Brookman has been awarded contract for furnishing the Agricultural College at Brookings with a complete system of electric lights.

CEDAR FALLS, IOWA—A. D. Ellsworth & Sons, strawboard manufacturers, have asked for franchise for an electric lighting and heating and power plant.

CHATFIELD, MINN.—The electric company which has just been organized at this place, for the purpose of furnishing the city with electric lights, is composed of Hon. Jos. Underleak, F. T. Drebert, M. H. Crane, A. L. Ober and A. M. Lombard. The capital is $50,000.

CENTERVILLE, MICH. — H. J. Hampson & Company have been granted a franchise for an electric light and power plant.

LANCASTER, OHIO—H. T. Mechling, City Clerk, can give information concerning gas and electric light fixtures for new City Hall.

WINNEBAGO, WIS:—James E. Heg, president State Board of Control, Northern Hospital for Insane, Milwaukee, Wis., may give information concerning electric light and power plant.

AMSTERDAM, N. Y. — Thos. J. Hazlett, City Clerk, may give information concerning lighting of the city with electricity.

TRENTON, MO.—Trenton Gas & Electric Light Company, H. A. & G. W. Gardner, gave real estate deed of trust for $10,000.

JONESBORO, TENN.—The town is to be lighted by electricity, and the work of putting up the wires is rapidly approaching completion.

HAMMONTON, PA. — An electric light plant has been established.

ALMA, MICH.—A. W. Wright will build an electric lighting plant and substitute electricity for gasoline in lighting the streets of Alma.

New Telephone and Telegraph Companies.

PULASKI VA.—Laughon & Hull have been granted franchise by the City Council for the erection of a telephone exchange.

BENTON, TENN.—The East Tennessee Telephone Company, Chattanooga, will construct a telephone system at Benton.

SAVANNAH, GA.—The Waycross Telephone Company, of Waycross, Ga., has petitioned the City Council for franchise to construct a long-distance telephone system in Savannah.

NEWPORT NEWS, VA.—The Citizens' Telephone Company will soon be in operation and will connect with several other exchanges. The officers of the company are M. B. Crowell, president; Chas. E. Fink, vice-president; W. Scott Boyenton, secretary; W. H. Landon, treasurer.

DECHERD, TENN.—The Bell Telephone Company has a newly established office here. Its business is in the hands of A. J. Hines.

DELHI, N. Y.—The Delhi Telephone Company has been incorporated to operate in Delhi and other villages in Delaware County, and also in Oneonta, Otsego County. Capital, $3,000. Directors, H. S. Graham, M. O. Landon, W. I. Mason, S. F. Adee, of Delhi, and others.

JACKSON, MICH. — The Michigan Bell Telephone Company is putting in a new plant in this city.

New Manufacturing Companies.

CLEVELAND, OHIO — The Dorner & Dutton company has been incorporated to manufacture and deal in street and electric railway supplies. Capital stock, $50,000.

DAYTON, TENN. — The Wheeler Electric and Manufacturing Company will be organized by W. E. Wheeler and others for the purpose of manufacturing the Wheeler patent electrical dental engine, together with other electro-dental and medical specialties and staples.

NEW YORK, N. Y.—The Enclosed Arc Light Company has been incorporated to manufacture inclosed electric arc lights. Capital, $5,000. Directors, Henry Clews, James B. Clews, William H. Perrine, of Mills Building, and William H. Acken and John Acken, of New York city.

EASTON, PA. — A company of eastern capitalists, with $100,000 cash, has purchased the old woolen mill of General W. E. Doster, at Bethlehem, and will manufacture electrical supplies.

Increase of Capital.

PHILADELPHIA, PA.—At a special meeting of the stockholders of the Powelton Electric Company it was decided to increase the capital stock from $450,000 to $600,000; 31,241 shares voted in favor of the proposition, there being no opposition.

Electrical.... Patents.

[Specially reported for this journal by E. S. Duvall, solicitor of patents, Loan and Trust Building, Washington, D. C. Copies of any patent may be secured for 10 cents each.]

ISSUED JUNE 15, 1897.

581,341 Apparatus for controlling electric motors; B. A. Fiske, U. S. Navy—An electric motor, a dynamo actuating the same, a reversing switch in the armature circuit of said dynamo, and a rheostat in the field circuit of said dynamo and controlled by said reversing switch.

584,352 Party-line telephone system; W. H. Harter, Norwalk, Ohio.

584,356 Electric arc lamp; I. H. Hegner, Paris, France.—Two or more arc lamps, means for preventing the feeding together of the carbons of any lamp until the resistance of the lamp group has attained the desired amount, and of a means for feeding the carbons of each lamp controlled by the resistance of its own arc.

584,382 Electrical circuit-closing thermometer; A. Luraschi, London, England—Consists of an adjustable movable terminal, completely inclosed with the thermometer tube, a perforated cross wire through which such movable terminal passes, such cross wire being sealed into the sides of the thermometer tube by fusion, and a fixed terminal always in contact with the mercury.

584,384 Automatic electric signal transmitter; A. B MacKlin, New York.

584,393 Telephone system; F. R McBerty, Downer's Grove, Ill.—A number of telephone circuits, including transmitting telephones, and having a common return conductor, two or more sources of current having different poles connected with the common return conductor, and their other poles connected with different circuits, whereby cross talk in the circuits is diminished or prevented.

584,414 Apparatus for telephone switchboards; C. E Scribner, Chicago, Ill.—An indicator frictionally connected with a source of mechanical power, a retaining catch normally engaging with said indicator, controlled by an electro-magnet.

584,415 Telephone line circuit; C. E. Scribner, Chicago, Ill.

584,416 Electro-magnet; C. E. Scribner, Chicago, Ill

584,417 Telephone circuit; C. E. Scribner, Chicago, Ill.

584,418 Spring-jack for telephone switchboards; C. E. Scribner, Chicago, Ill.

584,420 Hoisting machinery; A. J. Shaw, Muskegon, Mich.

584,427 Production of electric sparks for signals or theatrical effects; V. Tabulewitsch, St. Petersburg Russia—A lamp having an insulated coil secured to the base thereof, a tube having a closed bottom and open top mounted in said coil, and adapted to receive one end of an electrode and secure the same therein by means of clamps, and means for reciprocating said tube, consisting of a core of soft iron, and a spring-operated lever having a roller on its free end which is adapted to bear against the closed end of said tube, said electrode being composed of carbon, and the other electrode being composed of steel, said steel electrode being provided with means to permit a slight longitudinal movement of the same when the electrodes are brought together.

584,431 Armature for dynamo-electric machines; H. H. Walt, Chicago, Ill.

584,462 Electric-circuit protector; A. L. Creelman, Memphis, Tenn.—A main and a local telegraph circuit, in combination with a gravity switch through which the circuits pass, a retarding device operated by the said switch for reducing the speed of its downward movement, a magnet for retaining the switch in its elevated position, and a manually operated device for raising the switch and closing the circuit through the said magnet.

584,463 Electric signal; A. L. Creelman, Chicago, Ill.

584,464 Telegraph sounder; A. L. Creelman, Chicago, Ill.

584,465 Circuit-protecting sounder; A. L. Creelman, Chicago, Ill.

584,466 Telegraphic sounder; A. L. Creelman, Chicago, Ill.—An electric circuit, a sounder-magnet and a retarder-magnet forming a part thereof, a second circuit, containing a circuit-changing magnet, a contact carried by the armature lever of the retarding magnet for shunting the current from the first circuit through the second.

584,474 Primary cell; Isidor Kitsee; Philadelphia, Pa.—A positive element, consisting of a containing cup of a material designed to remain inert, a conducting rod passing through the cup, and a solid body of an alloy of mercury and a metal, as zinc, cast so as to fill the space between said cup and rod, the surface of said solid body only being exposed.

584,483 System of distribution; E. W. Rice, Jr., Schenectady, N. Y.—The method of maintaining potential upon a two wire system of distribution connected with a three-wire system, which consists in supplying the two-wire system with energy from both sides of the three-wire system.

584,496 Electric headlight; F. W. Dressel, New York, N. Y.

584,511 Electric Railway; T. W. Kloman, Montclair, N. J.

584,577 Regulating speed of induction motor; E. Danielson, Stockholm, Sweden—A number of induction motors mechanically connected together, said motors having different numbers of poles, and means for operating them singly or in tandem groups.

584,618 Telephone transmitter; H. C. Alexander, Bonham, Tex.

584,632 Lightning arrester and multiple automatic fuse-block; G. X. Gast, New Orleans, La.

For Sale.

Two shunt-wound, 125-volt, No 12 Edison, 30-kilowatt dynamos, with extra armature, rheostats, indicators, ampere meters; self-oiling journals in good condition. Price, $1,000. Two ditto, No. 10 Edison, 25-kilowatt, recently rebuilt, new fields, armatures, commutators, self-oiling journals. Splendid machines, with instruments as above-named—all running. Price, $900. Reasonable traveling expenses allowed to purchasers of machines. Address

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SALISBURY,
WICOMICO COUNTY, MARYLAND.

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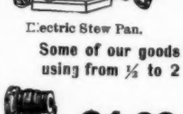

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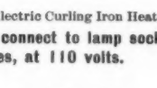

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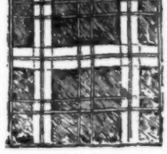

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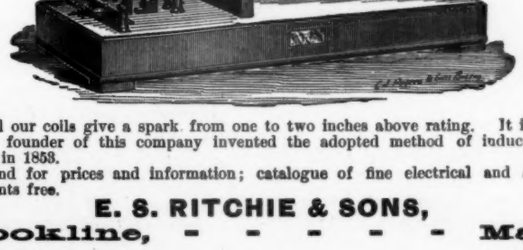

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TELEPHONE CONVENTION NOTES.

(Continued from Page 517.)

F. M. Kirk, the treasurer, in a cordial manner, entertained the company's guests at the convention.

The Western Signal Company, of Chicago, was ably represented by Mr. B. F. Stewart, whose time was divided between explaining the interesting exhibit of apparatus at parlor C of the Russell House and closing several contracts for fire and police alarm outfits. The apparatus of this company shows several novel features and is characterized chiefly by simplicity, without detracting in any way from its efficiency. After an automatic signal, either for fire or police, has been sent in, communication may be had by telephone for giving location and nature of trouble. An interesting line of portable telephones for use on street railways, etc., formed part of the exhibit, the portable set consisting of a complete battery telephone outfit with long-distance transmitter. It is inclosed in a carrying case the dimensions of which are only $4 \times 4 \times 5$ inches, making it probably the most compact outfit of that kind on the market.

C. D. Duncan, secretary of the Home Telephone Company, Chillicothe, Ohio, acted as a committee of one in decorating each delegate and visitor with a bow of tiny pink ribbon, known as "baby ribbon." This was probably because the association is rather young, and it is to be hoped that, at the next meeting, a committee will be appointed for designing an appropriate badge for members of the association.

J. D. Leatherbee, treasurer of the National Telephone Company, of Boston, was present. His company is one of the two Boston concerns now fighting suits brought by the Bell company to restrict them from using patents that it claims ownership of. Mr. Leatherbee has lots of fight in him, and he states emphatically that his company will fight to the end. The testimony is to be all in by September 1, and then the case will be argued. The decision of this case, and the one pending between the Century Telephone Company and the Bell corporation, is of intense interest to all independent telephone companies. The new association will doubtless assist to the utmost in the defense. C. E. K.

General Electric Railway Company.

The General Electric Railway Company, of Chicago, has won its fight, and Chicago will have a new street railway system with about 60 miles of track within a year. On June 23 the Supreme Court affirmed the decree of the lower court in an action brought by Attorney-General Moloney, of Illinois. That decree denied the petition for an injunction to prevent the construction of the General Electric Railway Company's system, and dismissed the bill. It is understood that the company will begin within 10 days the construction of an underground railway system to cost about $5,500,000. It is reported that since it has won its fight the General Electric Railway Company has been offered $3,000,000 for its franchises and present assets.

Northwestern Electrical Association.

The fifth semi-annual convention of the Northwestern Electrical Association will be held at La Crosse, Wis., commencing Wednesday morning, July 21.

FIFTEEN 5,000 - HORSE - POWER GENERATORS.

WESTINGHOUSE INTERESTS GIVEN A VERY LARGE ORDER.

It was announced at the directors' meeting of the Westinghouse Electric and Manufacturing Company, held at East Pittsburgh, Wednesday, June 23, that a contract had been made with the St. Lawrence Construction Company for furnishing 15 5,000-horse-power generators, of the same type as those made by the Westinghouse company and now in use at Niagara Falls, for utilizing the falls of the upper St. Lawrence at Massena, N. Y. The long-distance transmission will probably be for the cities of Ottawa and Montreal and other centers in that locality.

The plant will be the largest of the kind in the world and nearly twice the size of that at Niagara Falls. The cost of the machines is estimated to be about $800,000.

The directors' meeting at which this was announced, and of which the report will be found elsewhere in these columns, was held at 10 A. M. on Wednesday, and on the afternoon of the same day a member of the ELECTRICAL REVIEW staff was informed by a personal representative of Mr. George Westinghouse, at the Westinghouse factories at East Pittsburgh, that the work of constructing these generators would be begun very soon and as early a delivery of the machines as practicable would be made.

The above order, taken in connection with one recently given by the Cataract Construction Company for five 5,000-horse-power generators, makes a total of 20 generators of this size, having a capacity of 100,000 horse-power, which have been ordered from the Westinghouse company during the current year.

The scheme contemplated by the St. Lawrence Construction Company will take advantage of the natural conformation of the land in the vicinity of the Massena to create a waterfall. At that point the St. Lawrence River is about 50 feet higher than the small stream three miles away. The company is digging a canal to connect the two streams. A smaller stream empties into the St. Lawrence a few miles further down, and furnishes a natural outlet for the water of the canal. The company purposes to generate power at a sufficiently low cost to induce manufacturers to establish plants on its property. It is understood that the company is backed entirely by English capital.

Cashier Indicted for Embezzlement.

John S. Moyer, Chicago bookkeeper and cashier for the New York Insulated Wire Company, was indicted by the Grand Jury on June 25, on a charge of embezzlement and larceny. He is charged with embezzling $10,000 and the larceny of a check for $55, payable to the New York Insulated Wire Company. Moyer, it is said, indorsed this, and placed it to his private credit. Moyer was arrested at his home in Willmette, locked up in the county jail, and his bond was fixed at $21,000.

The Siemens & Halske Company and the Pennsylvania Iron Works Consolidate.

The Siemens & Halske Electric Company of America, of Chicago, and the Pennsylvania Iron Works Company, of Philadelphia, were consolidated at the annual meeting of the former company held in Chicago last week. The Philadelphia interests were given representation in the board of directors by the election of Charles E. Yerkes, William L. Elkins, Jr., and B. W. Grist. The other directors are Charles T. Yerkes, R. Suydam Grant, F. W. Whitridge, W. T. Butler, E. Z. Rice, and Martin Maloney.

The Pennsylvania Iron Works Company makes cable railway machinery, gas, and steam engines. The Siemens & Halske company manufactures a complete line of electrical apparatus, including a street railway system of its own. The products of the two companies are sufficient to completely equip electric plants of any kind. The combined capital controlled by the consolidation is $3,250,000.

A few months ago negotiations were completed and practically settled for the consolidation of the Siemens & Halske Electric Company and the Fort Wayne Electric Corporation, of Fort Wayne, Ind. The final deal was not completed, owing to the fact that the Siemens & Halske company placed what was said to be too high a value on certain items in the inventory of their assets.

The Inclosed Arc Lamp.

TO THE EDITOR OF ELECTRICAL REVIEW:

In the paper on "Recent Progress in Arc Lighting," read on June 9 by Prof. Elihu Thomson, at the Niagara Falls Convention of the National Electric Light Association, much space is naturally devoted to the discussion of the inclosed arc lamp. Professor Thomson remarks, "the inclosed arc lamp, broadly speaking, is an outcome of the ability to secure very nearly pure carbons." He also claims to have made some experiments in this field in 1879, and states that "for many years after that date (1879) there were not to be found such pure carbons as would give so little deposition as is required to work an inclosed arc practically."

I am much surprised that one so well posted in the state of the art as Professor Thomson should ascribe the success of the inclosed arc to the "ability to secure very nearly pure carbons." As pointed out in my recent paper, read before the International Electrical Society, at Paris, in January of this year, the history of the development of the inclosed arc is the record of a succession of failures up to 1894, when, as a result of my work, the first successful inclosed arc lamps were put on the market. The commercial inclosed arc lamp is only three years old. Of the thirty odd thousand inclosed arcs now in successful daily operation in this country, nine-tenths have been installed within the past two years. Was this phenomenal growth due to the discovery of a pure carbon? Inasmuch as practically the same grade of inclosed arc carbon as is now extensively used was to be found in the open market at least five years before the advent of the successful inclosed arc lamp, the sudden rise must have been due to another cause.

As Professor Thomson has remarked, and as pointed out by me in my Paris paper, "the idea of burning an arc in a practically closed and relatively small glass chamber is quite old." But the idea of operating a high-potential arc within an inclosure, and maintaining the arc with a small expenditure of current, is, however, new. Although years before I had used very nearly pure carbons in my investigations with inclosed arcs, still the experiments resulted in failure after failure, until the idea of the high-potential arc was evolved by me. This method of operation, an account of which was first given to the National Electric Light Association at the Washington, D. C., convention, in February, 1894, involves an essential principle of all practical inclosed arcs, and marked the beginning of the commercial inclosed arc lamp industry.

As a contribution to the history of the art, Professor Thomson's reference to his unsuccessful experiments in this line is interesting, as is all that comes from his pen; but it is quite clear that the successful introduction of the inclosed arc system was not due to his efforts. L. B. MARKS.

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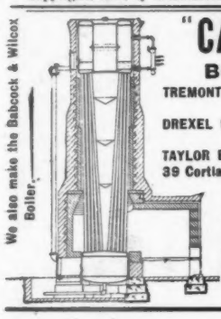

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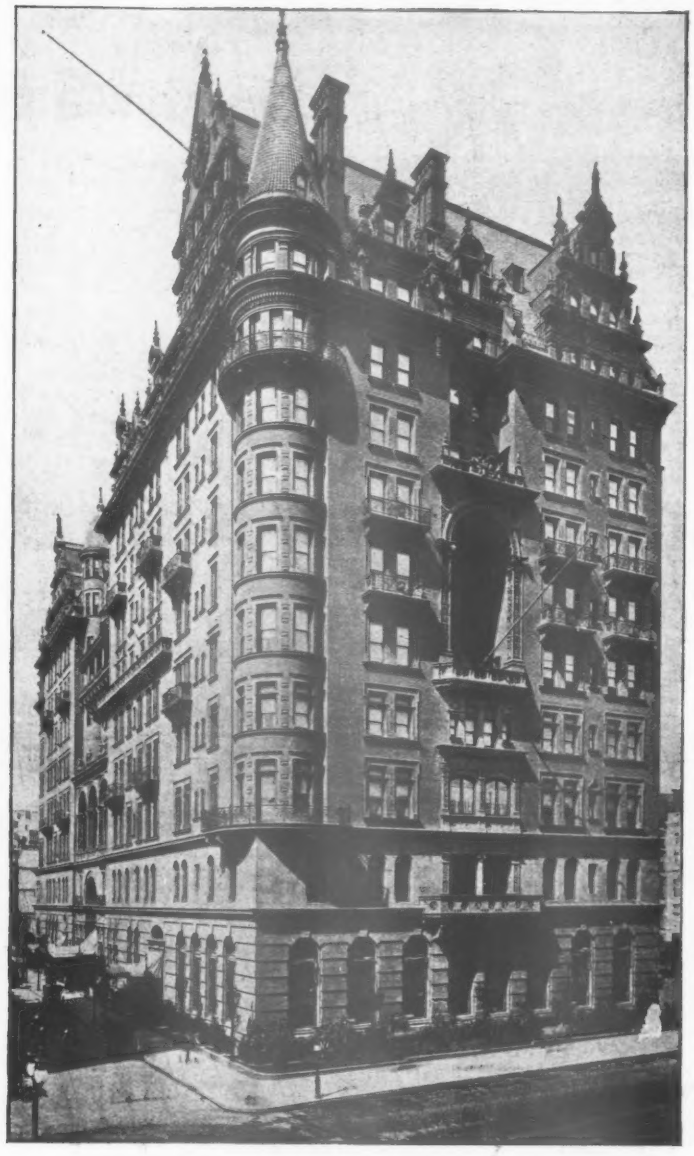

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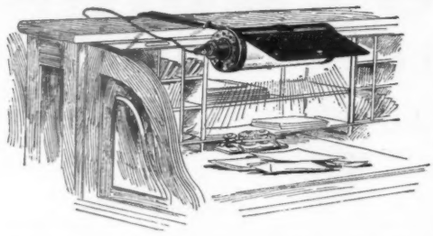

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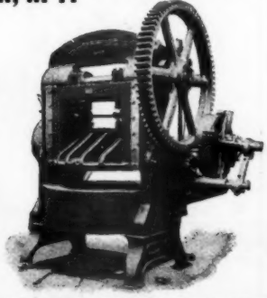

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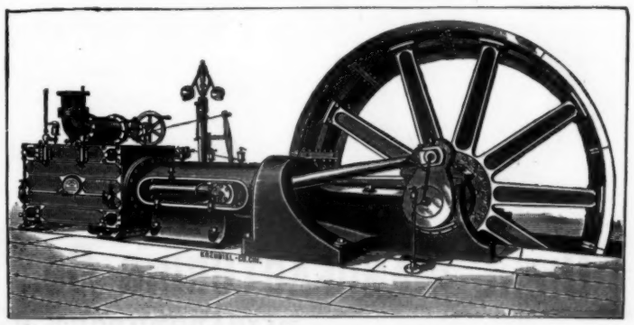

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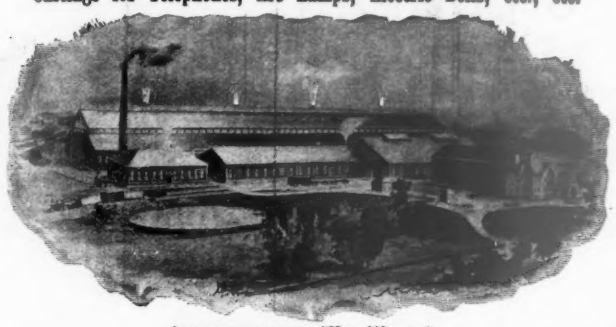

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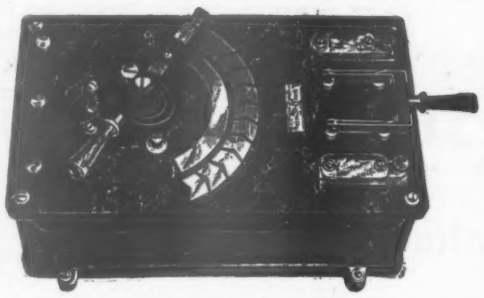

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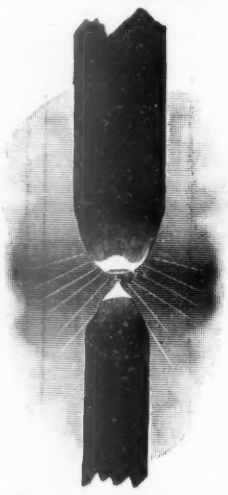

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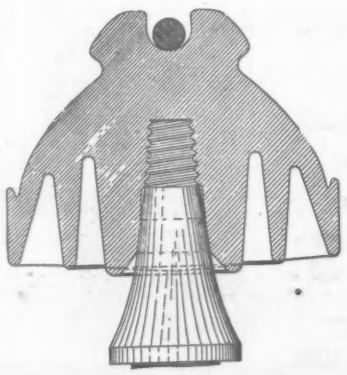

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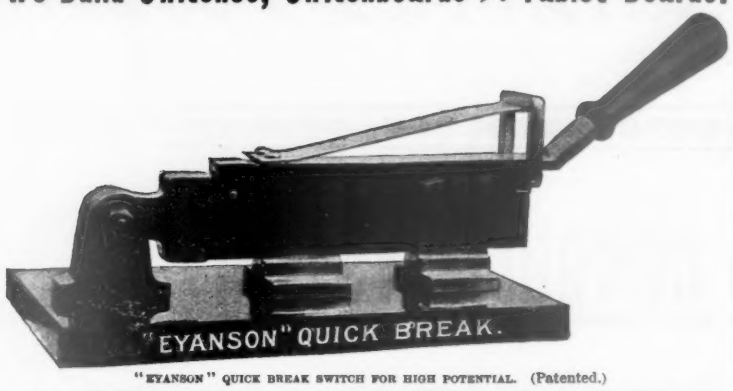

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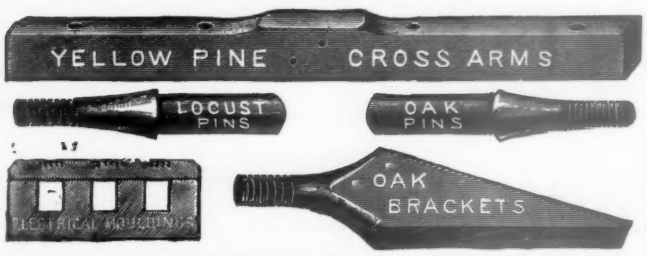

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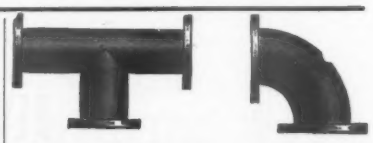

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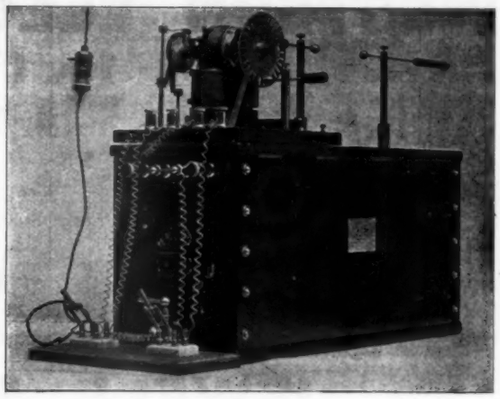

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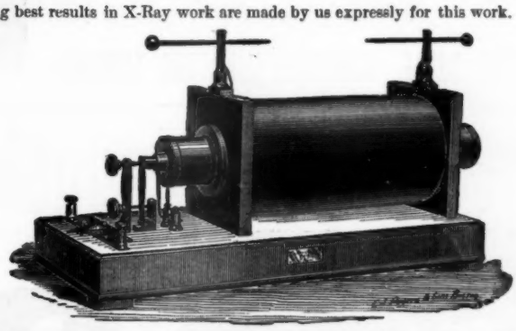

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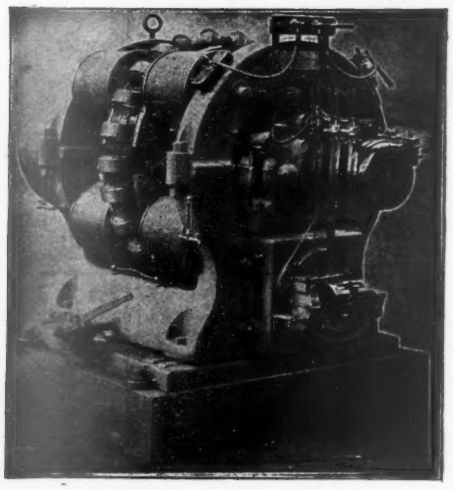

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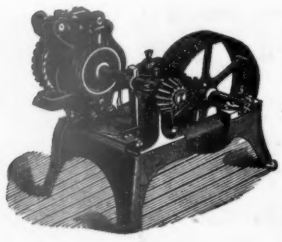

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Superintendent.

NOTE—The above letter will be of particular interest to those in charge of electric stations driven by water-power, from the fact that the above named plant combines difficult conditions which are often met with; namely, an electric road of moderate size driven entirely by water-power; the load often varies from friction load to the entire capacity of the plant. L. W.-W. GOV. CO.

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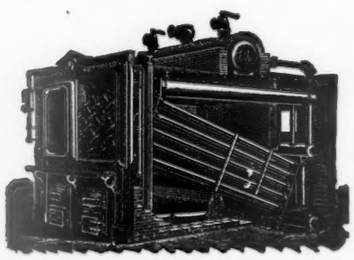

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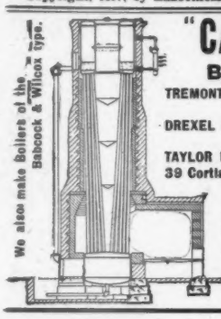

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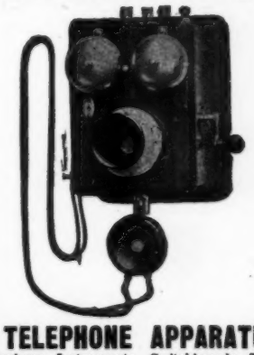

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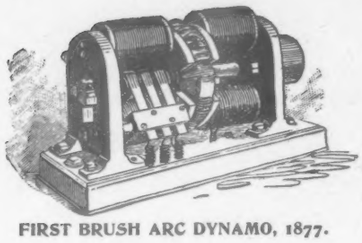

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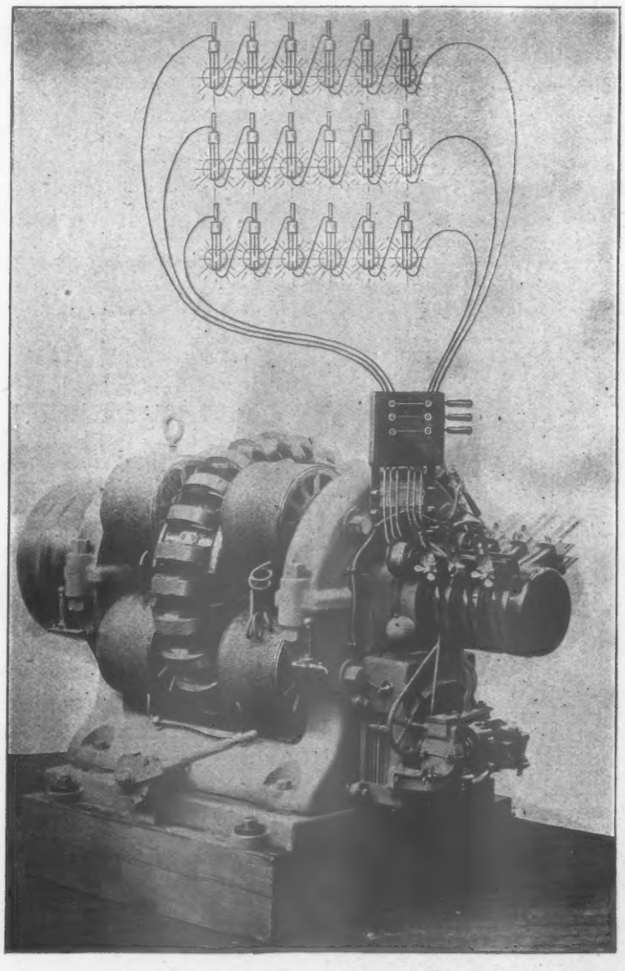

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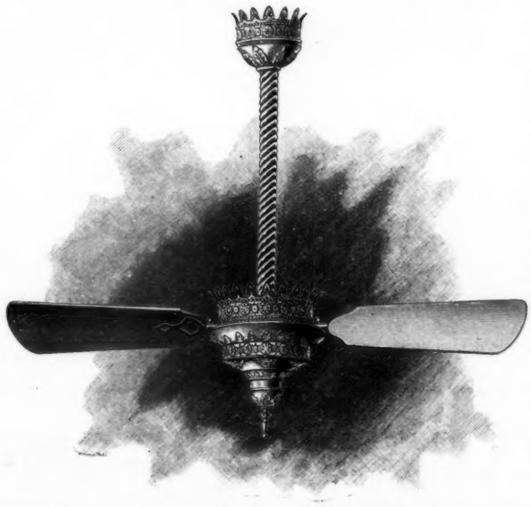

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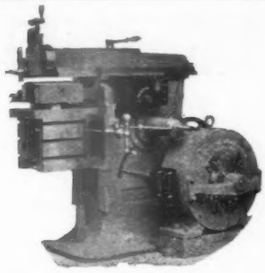

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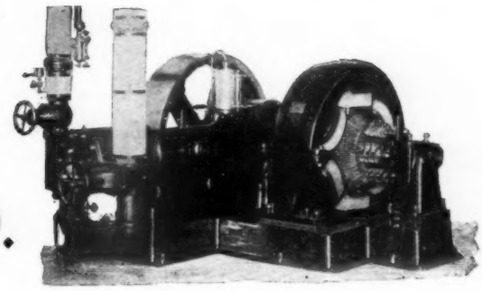

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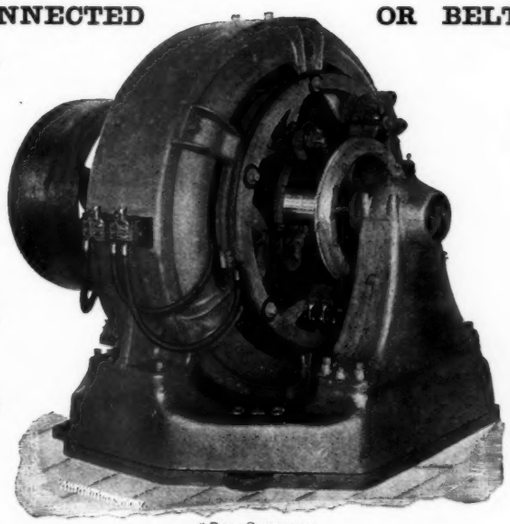

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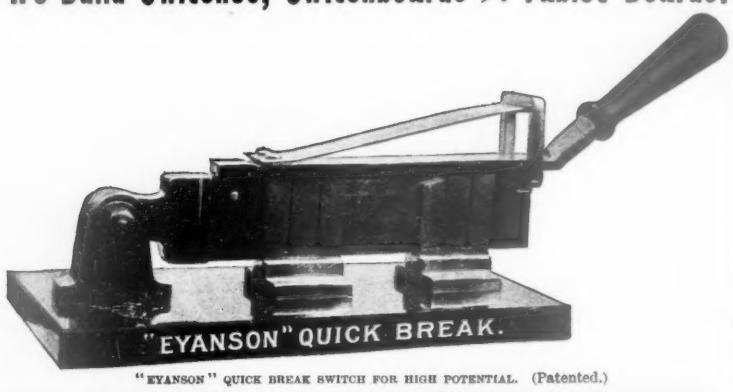

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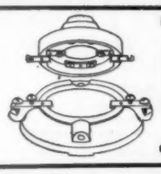

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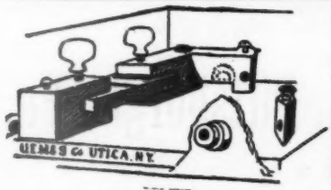

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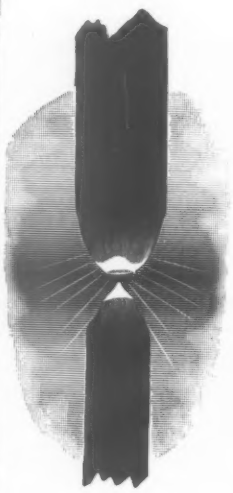

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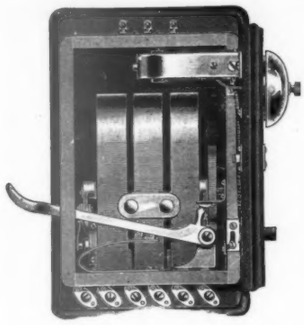

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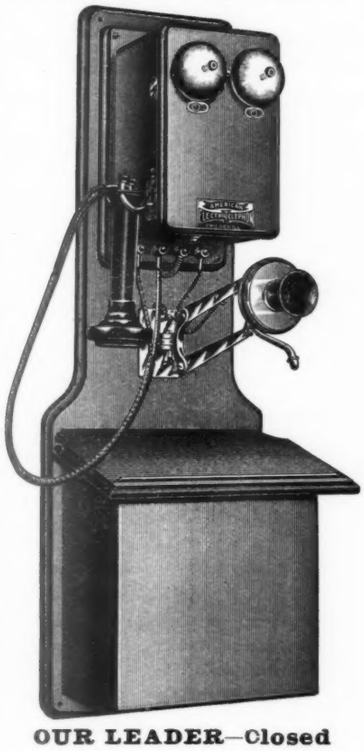

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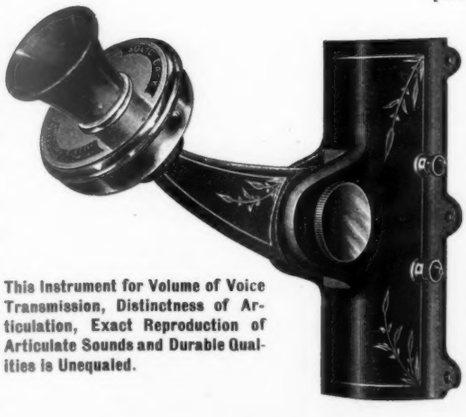

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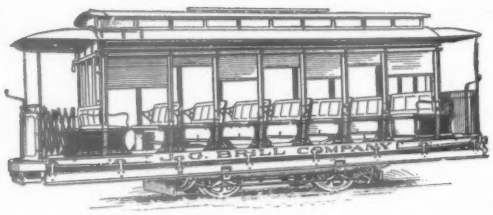

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⅞	15.04	138.12	155 03	223.61	84 55
¾	15.11	127.67	133.24	191.06	83.68
⅝	15.88	131.50	112.65	162.80	80 25
½	16.47	126.87	90.04	127.73	75.95

Test of a 35 inch SAMSON, Feb.1,'97.

Gate Open.	Head.	Rev. Pr. Min.	Cu. Ft. Pr. Sec.	Horse Power.	Per Cent.
Full	15.29	194 25	102.02	143.44	81.08
⅞	16.56	187.75	92.15	146.73	84.78
¾	17.33	178.50	83.95	138.40	83.88
⅝	17.54	176.40	68.82	109.64	80.09
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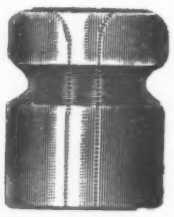

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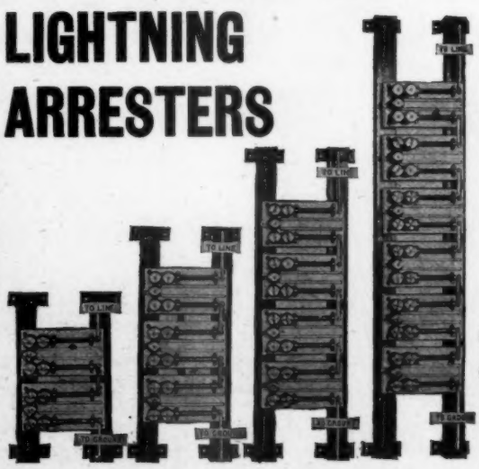
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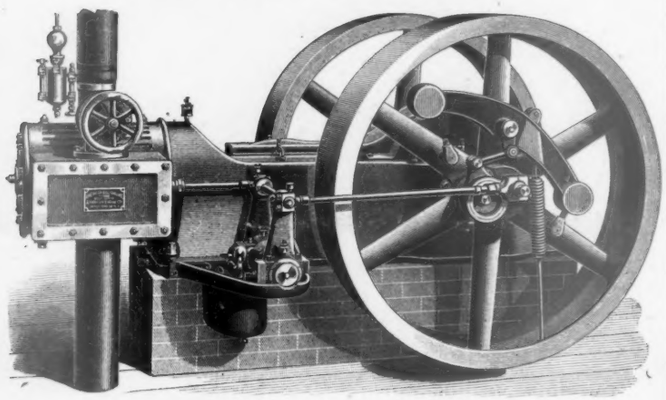

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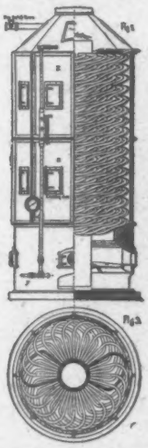

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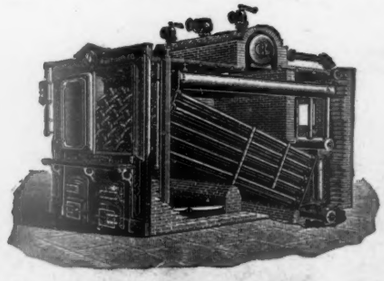

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